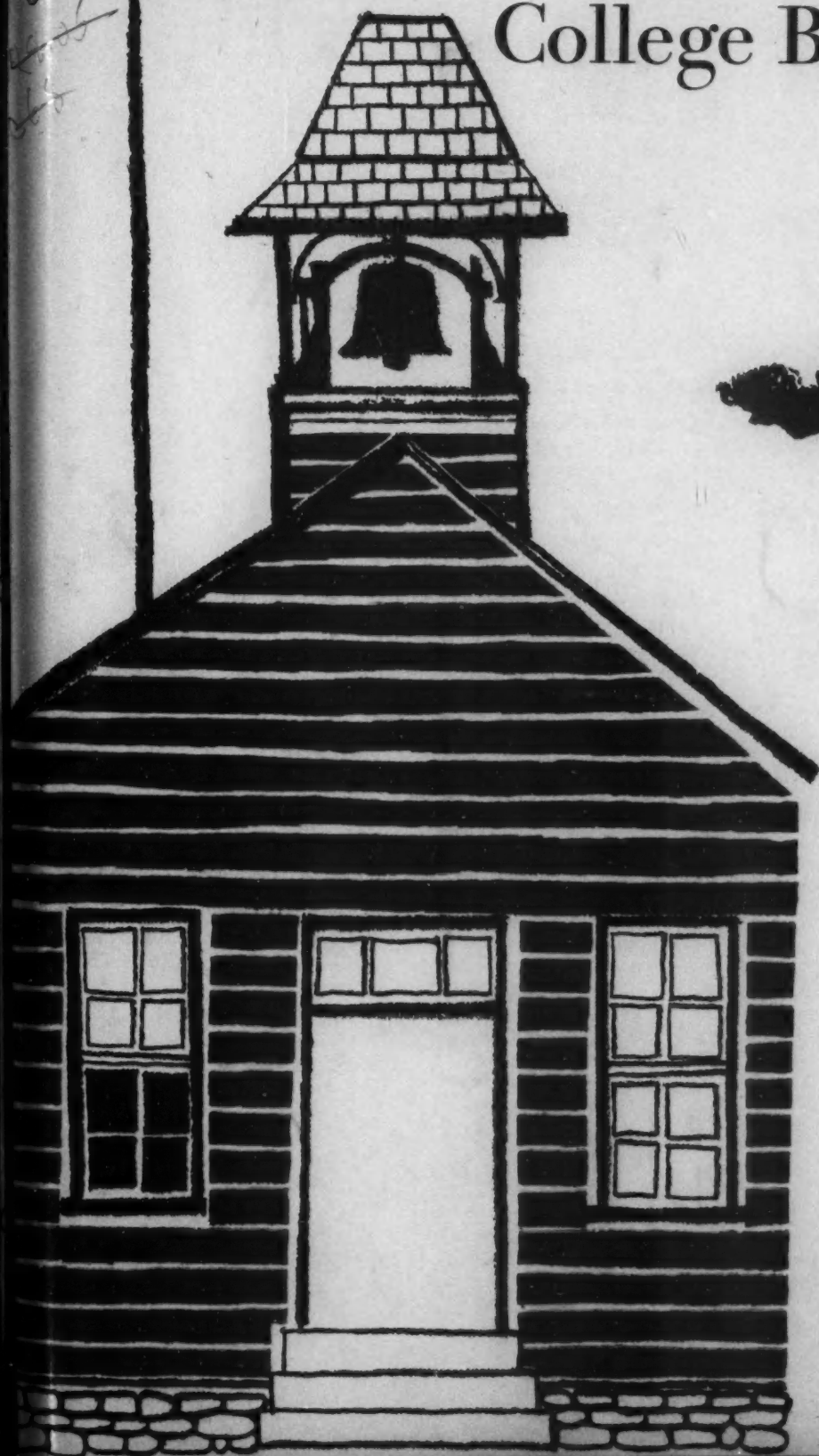


# College Board Review

WINTER 1959 • NO. 37



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The College Entrance Examination Board is composed of 250 colleges and 37 member associations. Each member college has two representatives on the Board. Member associations have from one to six representatives. Members and their representatives are listed in the *Report of the President*. Meetings of the Board are held on the last Wednesday in October.

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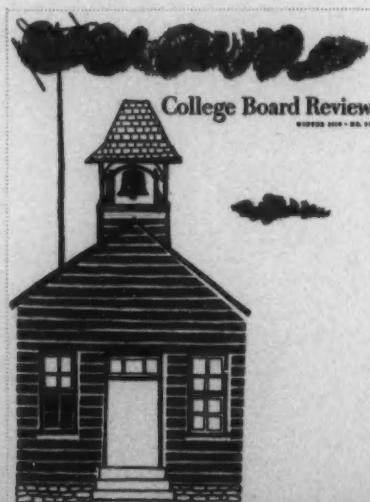
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Illustrations: Freedom in education as the theme of this issue's cover evoked a contemporary image of an old tradition by artist Dan Shapiro. Accompanying two articles which reflect a keen sense of that freedom are drawings by Vincent Malta (pages 3, 6) and Richard Welch (pages 25-28). All other illustrations, including those in reports on education in a land without freedom, are by Stanley Wyatt.

## NEWS OF THE COLLEGE BOARD

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### Preliminary SAT announced

**New October test:** A new College Board test, to be named the Preliminary Scholastic Aptitude Test (PSAT), will replace the Scholarship Qualifying Test next fall. The PSAT will be available for administration by all secondary schools on either of two dates, Tuesday, October 20, or Saturday, October 24, the choice of date to be made by the individual school. The fee will be one dollar per student.

The new test, a two-hour version of the three-hour Scholastic Aptitude Test, will be offered to fill two needs: the early guidance of college-bound juniors, and the screening of seniors who hope to qualify for scholarship programs which will require the PSAT.

In voting to introduce the test, the Board's Trustees considered the rapidly growing interest of schools in junior year guidance and the desirability of providing a low-cost instrument that would yield scores which could be directly related to senior SAT score information. Thus, in forecasting SAT performance, the PSAT will assist guidance officers in advising juniors on their college plans and choices. Interpretive information prepared by the Board will be sent to schools with the scores.

Recent trends indicate unmistakably that schools are encouraging their college preparatory students to take College Board tests in the junior year. The number of juniors taking the SAT in 1958, some 126,000, was six times as great as five years ago, although the number of seniors taking the test increased less than threefold during the same period. Also, more than 172,000 juniors took the SQT last October when it was first opened to juniors.

The Trustees pointed out as a further advantage of the PSAT a saving of six dollars in the case of juniors who substitute it for the SAT for guidance

purposes. The difference in test fees is accounted for in large part by the difference in cost between a two-hour guidance test in which registration and administration is undertaken by the school and a three-hour admissions test in which registration, together with score reporting to colleges, is on an individual basis and administration is conducted by the Board under full security conditions.

**Scholarship candidate use:** The PSAT will be open to seniors in the interest of the many scholarship sponsors who need a nationally administered screening instrument. Last year 1,600 scholarships were awarded by sponsoring businesses, educational societies, and fraternal organizations which required the SQT as part of their selection procedures. Information on programs which will use the PSAT in 1959 will be sent to schools this spring and fall.

**PSAT details:** The new test will be similar to the SAT in all respects. It will use the same kinds of objective questions and measure the same verbal and mathematical abilities. It will yield separate verbal and mathematical scores on a scale ranging from 20 to 80, a gradation parallel to that of the Board's standard admission test scale of 200 to 800. This will enable guidance officers to relate the preliminary scores directly to admissions test score information.

A school may administer the PSAT on either October 20 or October 24, but all students taking the test must register only for the one date chosen. A different form (edition) of the test will be used on each date and the school must agree to administer the form for which it registers on the chosen date.

The test may be given at any secondary school in the United States and its territories and possessions. Arrangements for registration will be made through the Educational Testing Serv-

ice, which will mail additional information and early registration materials to schools this spring. Complete information on the test and scholarship sponsors will be mailed early in September, at which time schools will be asked for their final registrations. The test scores will be reported in December.

### Admissions practices studied

**Committee appointed:** A comprehensive and continuous investigation of college admissions practices and problems has begun with the appointment of a new College Board standing committee, the Committee on Entrance Procedures.

The committee has been charged "to study the problems in the area of college entrance procedures, to initiate and oversee the collection and dissemination of information relating to these problems, and to develop for consideration possible solutions to these problems." Sidney B. Bennett, secretary of admissions, Hamilton College, will serve as chairman. It is expected that the committee will meet for the first time this spring.

The problems which will confront the committee, involving such factors as multiple application, changing admissions schedules, increased costs, and uncertainties on the part of both candidates and colleges, have been matters of growing concern to schools and colleges in recent years. They have been discussed at College Board meetings and in *Review* articles (see page 8).

Members of the committee in addition to Mr. Bennett are: G. Grenville Benedict, Phillips Academy, Andover, Massachusetts; Mary E. Chase, Wellesley College; H. Westcott Cunningham, College of William and Mary; Virginia Deane, North Shore Country Day School, Winnetka, Illinois; Burton W. Dunfield, Denison University; C. Wil-



liam Edwards, Princeton University; Robert L. Foose, Westfield (New Jersey) High School; O. W. Hascall, University of Colorado; and Joe Jefferson, Columbia University.

Also, Brother Brendan Joseph, Manhattan College; Richard W. Mechem, Walnut Hills High School, Cincinnati, Ohio; Kenneth L. Peters, Beverly Hills (California) High School; Rixford K. Snyder, Stanford University; Ann Splitstone, Hollins College; and Harold Zuckerman, Board of Education of the City of New York.

#### Advanced Placement meetings

*Scheduled for June:* The annual spring conferences for school and college teachers and administrators interested in the

Advanced Placement Program have been scheduled for late June.

Eight subject matter conferences will be held on the same dates, June 25-28. Their subjects, chairmen, and sites are as follows: Biology, Professor Phyllis Martin, Chatham College; Chemistry, Professor Earl A. Engle, University of Denver; English (two conferences), Professor Dwight N. Lindley, Hamilton College, and Professor George C. Hoffmann (of Portland State College), Reed College; Foreign Languages, Professor Lawrence B. Kiddle, University of Michigan; History, Professor Thomas C. Mendenhall, Yale University; Mathematics, Professor Leonard W. Vaughan, Ripon College; and Physics, Professor Richard M. Sutton, California Institute of Technology.

A second Physics conference will be held June 22-24 at Rensselaer Polytechnic Institute under the chairmanship of Professor Robert Resnick. The administrators' conference is scheduled for June 18-21 at the University of Michigan under the chairmanship of Ray E. Kehoe of the university's bureau of school services.

#### Candidates Reply Date

*May 20:* Colleges which will observe the May 20 Candidates Reply Date for 1959, the earliest date by which participating colleges can ask candidates to reply to notifications of admission or financial aid offers, are indicated in the list of College Board member colleges which appears on page 41.

## COLLEGE BOARD RESEARCH NOTES

### Predicting drafting grades

*Effect of prior training:* In a recent study of students at the United States Naval Academy that was conducted for the College Board, it was found that those who had already taken mechanical drawing courses received higher first-term engineering drawing grades than those who had not taken mechanical drawing yet had earned comparable scores on a Naval Academy test in spatial relations.

Both groups of students were about equal in ability as indicated by scores on a general aptitude test given by the academy.

The study was made by Charles T. Myers, associate in test development at ETS. It concluded that both spatial relations test scores and the fact or lack of previous mechanical drawing training are predictive of performance in college engineering drawing courses.

In another recent College Board study, Mr. Myers suggested that two possibly interrelated aspects of the kind of ability measured in spatial relations tests might be measured separately. One is the capacity to perceive meanings in representations of three-dimensional figures and the other the capacity to reason or draw logical conclusions about these representations.

Although the College Board's Spatial Relations Test was discontinued as a regular entrance examination beginning this academic year, it is still available in the Board's Placement Test program.

### Motivation study approved

*To use "values inventory":* A study of the measurement of the long-range motivation of secondary school and college students for academic study will be conducted for the College Board by George E. Schlessler, professor of education at Colgate University.

In the recently authorized study, Dr. Schlessler will further try out and improve the "personal values inventory" that he has developed. His investigation is part of an expanded program of College Board research, now in its fourth year, in nonintellective factors affecting college performance.

*ETS projects:* Two studies to be conducted by members of the staff of Educational Testing Service have also recently been approved. In one, Rosa M. Scheider, associate in test development, will compare the scores of two groups of students—those taught by traditional methods and those taught by the "direct method"—on College Board

Achievement Tests in modern languages. According to the study's author, in the direct method, translation and the teaching of isolated words are replaced by teaching vocabulary and grammatical rules in the context of the foreign language.

In the other ETS study, Richard Levine, assistant director of statistical analysis, will develop charts relating scores on four graduate-level or professional school tests to scores on the College Board's Scholastic Aptitude Test. Among tests of the former kind are the Graduate Record Examination, the Admission Test for Graduate Study in Business, the Law School Admission Test, and the Medical College Admission Test.

It is hoped that the charts will enable both school and college advisers to estimate the probable performance on these tests of students they are counseling in connection with future study.

### Scholars confer

*On environment studies:* About 20 invited scholars interested in the subject met January 30 in an all-day conference on the "study of college environments" that was held under College Board sponsorship at the Board's offices in New York City. Professor C. Robert Pace of Syracuse University served as director of the conference.



## *Conceived in liberty*

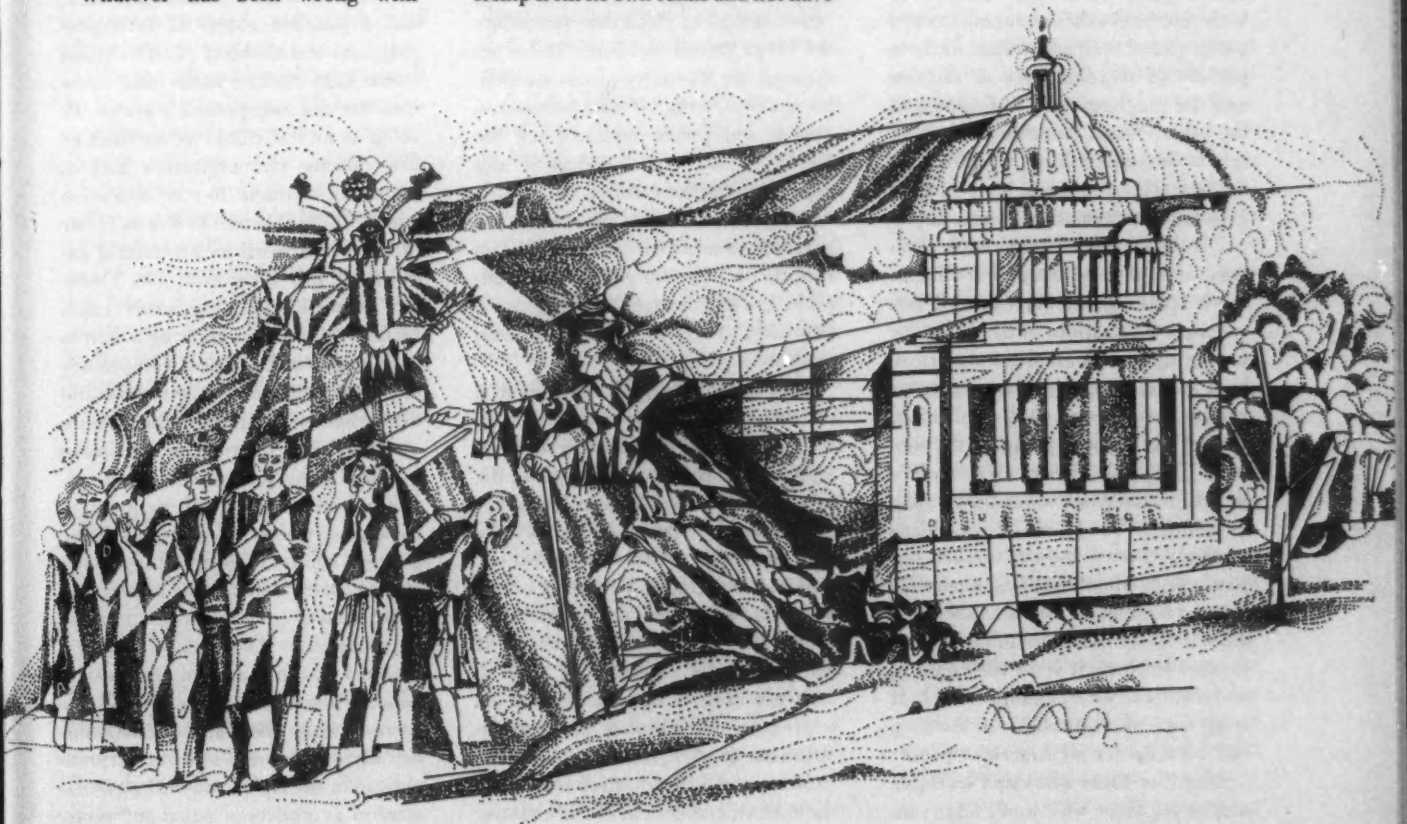
Ever since the ascension of Sputnik I on October 4, 1957, everyone in America has been stepping delicately around the presumed corpse of American education and casting suspicious glances at educators, school boards, schools of education, teachers' colleges, and the Congress of the United States. Educational literature and the public press have turned to sleuthing, and the inquiry into the deficiencies of our schools takes on the atmosphere of a "whodunit." The amateur or academic detectives are likely to say that a philosophical butler named Dewey, or that gentleman's gentleman, Kilpatrick, did it. (Certainly no one would hold that a Butler named Nicholas Murray did it.)

Whatever has been wrong with

American education and whatever is still wrong with it, whether it is mere malingering or a sickness unto death, it has come about through natural causes and not by a conspiracy of villainous false prophets in education and their oafish gibbering disciples. Not that the educational profession stands guiltless in this respect; it might have been more critical of itself. It might have subjected to a franker and less tolerant criticism the starker idiocies of its vociferous lunatic fringe. It might have been less complacent and self-protective, and less professionally courteous towards its mountebanks and their clownish cabals. It might also have provided more constructive criticism and more true philosophical leadership from its own ranks and not have

waited for the criticism to come from outside the profession.

But on the whole, the influence of the charlatans, and the extreme free-thinkers or nonthinkers among the pedagogues, has been greatly overestimated, and their effect upon substantial practice the country over has not been nearly as great as the polemicists in this educational controversy have alleged. Moreover, in all candor, it must be freely admitted that there have been mitigating circumstances for both the crimes of omission and commission in American education. The deficiencies of the schools are not deficiencies of the teaching profession alone, but deficiencies of the culture.



If the American school system belonged less to the people and to the present and more to the world of scholarship and to the past and the future, it would be a less sensitive and, therefore, a less culpable reflection of an imperfect and culpable society. But the schools would probably also be less dynamic, less responsive than they are, and in a free society, though truer to their historical mission, less serviceable to the immediate present purposes which a restless and dynamic and slowly maturing culture defines and redefines for them decade by decade and almost year by year. If schools were concerned with remoter suspended objectives, as they once were and elsewhere are, they would be easier to administer, much easier to teach in, and much less vulnerable to public opinion and public aspiration.

#### *The intangible controls*

America's schools, for better or for worse, are intimately the engrossing venture of the American people. It is probable that the people make and will make as many mistakes in this public enterprise as they have made and will make in self-government. In both enterprises they are amateurs and pioneers and their schools are likely to partake of the ebullience of the one and the roughness and restlessness of the other. When America has grown to a more stable culture, it is probable that the schools will reach a period of greater certainty and stability, also.

For the schools in America are peculiarly subject to the intangible controls of the political, social, cultural, and religious expectations of the American people as a whole, and the American high school struggles with monstrous variety, vagueness, and vacillation. Thus when anyone speaks on the subject, "This is the American secondary school," he must face the overwhelming question, "This is *whose* secondary school?" James Bryant Conant has wisely pointed out that it is impossible to generalize about the American high school. What the high school is depends on where it is in the country, and who pays for it, and how much. It is at once an institution of learning and a refuge for all American youth: a refuge for those who can't learn, as well as for those who won't learn; an

institution of learning for those who can and will. It can be a very large adolescent sitting-service, a training school for "salable skills," a trade school for apprentices, a manufactory of citizens, or a combined delicatessen and sweet shop for those with light and finicky appetites for learning, but with no other place to pass the time.

All of these uses find some degree of sanction from some segment or another of society or the educational profession. If schools are to be for all the children of all the people, they can never be caught in transgression and no act of theirs can be a trespass, for their obligations are as boundless as society's loftiest or silliest hopes. He who burns to be all things to all men can be assured that he will do no serious injury to any and possibly no significant good, but he will make ashes of his own integrity.

However, my intention is neither to defend nor denounce, but to describe the intangible controls on the American secondary school. Nevertheless, what it should be and can be both depend ultimately upon an understanding of the influences by which its present status and destiny are being shaped. And if we are to aspire to better things in American education, the better things can come about not through the ingenuity of our curricular arrangements, or the persuasiveness of our public relations and the fervor of our own convictions and capacities for leadership, but by the remedy of fewer or wiser or more humane or less provincial controls on education, both tangible and intangible, and less evangelical taking up of all society's burdens by the educational profession.

Among the intangible controls in a country so inextricably plighted in its government and education to the principle of democratic participation, the intangible political controls loom very large indeed. It is chiefly through the instrumentality of the schools that our political expectations, implicit or explicit, are expressed and our political hopes launched toward fulfillment. If the profoundly radical idea that all men are created equal is to find its expression and ultimate proof in institutions of a free society, the first expression and demonstration must be in the educational system of the country.

#### **On the secondary school**

The accompanying article is one of eight addresses on the theme, "This is the American secondary school," that were presented at the College Board's Sixth Colloquium on College Admissions, held last fall.

Proceedings of the Colloquium, the first to be devoted entirely to secondary education, will be published late this spring as *College Admissions* 6.

Eight years ago, I tried to express this relationship of education and political theory in America in the form of a syllogism. This is the construction I made then: (1) The democratic faith rests upon the postulation of primary, fundamental equality and assumes (a) that all men are equally capable of and equally responsible for participating in the complex process of self-government, and (b) that all education will uphold that faith by imparting a common fund of knowledge and precept, a common sense of political obligation, and a common ability in intelligent judgment and election; (2) The democratic faith further holds that every man has the indisputable right to develop as an individual to the limit of his capacity and aspiration and is, therefore, entitled to an education which will enable him to live as richly in mind and spirit as his natural endowment will allow him; (3) Therefore, education in a democracy has a twofold objective of training a man to such social and political competency as will enable him to preserve life and liberty and to such philosophic balance and flexibility of mind as will serve him well in his pursuit of happiness.

The primary political assumption, then, from which flows the intangible political control of all education in the United States is that a working majority of men of good will can and must be educated to the responsibilities of citizenship. This sort of control on education is a political control, in my opinion, only when it is practiced politically or when the school interprets politics or the rights and duties of citizenship as matters of ritual and senti-



ment. If the political control is thus expressed in our schools, it is likely to lead to an extreme of sordid instrumentalism and pragmatism. Under this philosophy, citizens are made merely by a mass immersion in patriotic emotions or by a casual doctrinaire acquaintance with the outward shows and exercises of popular government.

### *Proper political spirit*

But when the control by a great political heritage is manifest in an intelligent and appropriate way in schools, it is manifest, in my opinion, not in the teaching of political forms but in the teaching of political mores—the moral climate in which a free society breathes and has its being. In this case the emphasis is upon the teaching, not of citizens but of persons who are free and equal, not by right of political declaration alone, nor because of free institutions alone, but free because they are men and the children of God. This I would call the humanistic expression of political control as opposed to the instrumentalist or totalitarian expression which conceives the schools as primarily instruments for the service of the state rather than as instruments for the instruction, cultivation, and cherishing of persons.

The way in which a school responds to the curbs and spurs of intangible political controls can make a great difference in the curriculum and teaching of the school, and can make a great difference ultimately in the condition of freedom in this country. Democracy can expire as readily of a surfeit of self-love and mindless conformity as it can by way of infection from without. It is, therefore, our obligation to inquire into the public philosophy regarding our schools' proper tasks in

the preservation and advancement of the democratic way of life. It is not, I think, coincidental that the instrumentalist, pragmatist campaign of the teachers' colleges for education for citizenship has historically been concerned quite frankly with using the schools as instruments of social reform. This use seems to find its justification in the presumptuous premise that socially conscious educationists know what is good for the country and the rest of us. It is not impossible for intangible political controls to become tangible and oppressive if educators lay claims to messianic responsibilities and offer their services toward the achievement of a political millennium.

Schools can be and have been corrupted both from without and from within by those who have regarded them as expedient tools for the building of a new state. I would assume that the public philosophy in this country still intangibly maintains that both schools and state exist for the enrichment of the lives of free men and the enlargement of their freedom. Political freedom, though lately won and held through bitter struggle, is after all only a small gift and but the precondition to that wider freedom which is not a freedom *from* but a freedom *for*, the freedom to stand up in the full stature of man.

For the first time in history, if man survives at all through this atomic age, he has the possibility all over the world to rise and live as a man, not as a beast or a slave, or economic man or political man, producing-man or consuming or enfranchised man, but as an artist in life, a creator of beauty, enjoying the self-delighting and God-exalting powers of mind and spirit which have been his true birthright since the Lord of the universe placed His hand on a shaggy ancestral shoulder. If our world survives at all, it cannot be a far journey, now, to mankind's promised land and new Eden.

Thus, if the public philosophy says that the schools exist for the person, then the school's first moral as well as political obligation is to turn out not citizens of a democracy as such but free men, that is, men who love freedom and know how to love it, to use it as well as preserve it, to enjoy it as well as defend it.

The intangible social controls on the

American high school are very intangible indeed, much more complex and various than the political controls. The relevant question here is: What can we or can we not do in the schools because we are the sort of people we are, with the sort of social ideals and aspirations that we have for our youth? If our political aspirations are, on the whole, nation-wide, our social aspirations are certainly not, but are characterized by wide variation geographically and a considerable stratification sociologically. What a school can be or do depends on where it is and who goes to it and who pays for it. These are the facts, these are the realities, and while academicians may squirm under an uncompromising tyranny of prevailing social controls, those who discuss possibilities of educational change must face up to the situation squarely. In the words of the old song any school might sing to its community: "You made me what I am today, I hope you're satisfied."

Both the strength and defects of schools are in large measure reflections of the low or high expectations and degree of support provided by the local community. Since education is a kind of secular religion in America, and since the first or clearest expression of America's creed is that without education "you can't get anywhere," it is obvious that the social controls in education, though intangible, have almost the power of religious teaching. And since in America everybody wants to get somewhere, and somewhere is frequently everywhere, the school's curriculum has been fashioned or fractured to provide accommodations for all.

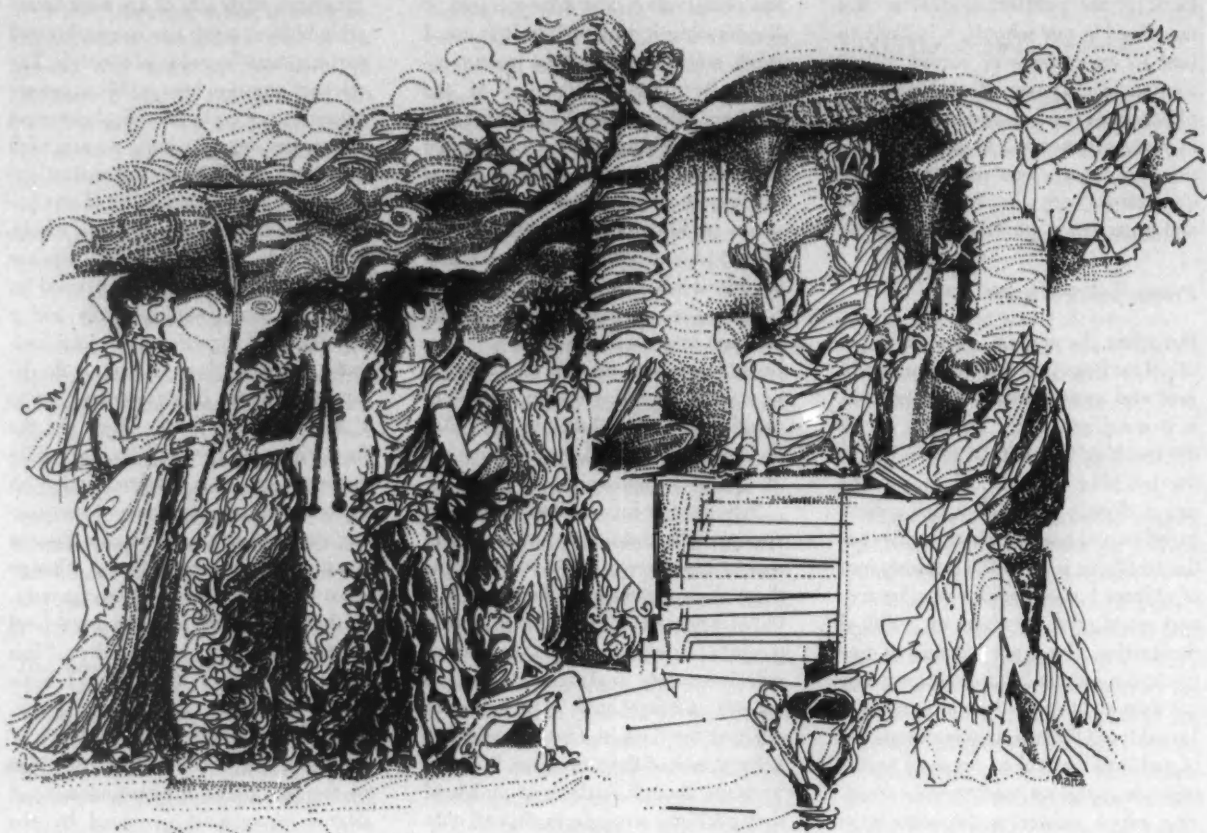
### *Which curriculum?*

Almost any course offered in a school can be made to make sense in the broad and catholic definition of the school's obligation to serve all the children of all the people. Thus by the implicit or explicit sanction of social mobility, as well as through the ineffable persuasiveness of its practicality or usefulness, every course with a vocational objective makes sense. Likewise, every course which can claim to develop social poise, or good health habits, or cooperativeness, or a facility in winning friends and influencing



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people, also makes sense. The question before the house is: How much sense, and particularly how much sense in relation to other purposes?

To say that all kinds of experiences in a school, as in the world outside, can be valuable educationally is not quite the same thing as saying that all subjects are created equal. The exotic outgrowth of intangible and ill-defined social controls or social aspirations has been that orchid of American pragmatism known as the "life-adjustment curriculum." This forced bloom has received wider notice and has come to be regarded more seriously than its delicate root and its meager odor deserve. It is difficult in any case to attribute the fad, foible, or fancy called life-adjustment education to an intangible social control, inasmuch as it was sportively engendered in 1947 by a Commission appointed by the United States Commissioner of Education. In its definition, the Commission clearly expresses what it conceives to be the social expectations of the American public at large:

"The Commission defines Life Adjustment Education as that which better equips all American youth to live democratically with satisfaction to themselves and profit to society as home members, workers, and citizens."<sup>1</sup>

The Commission's comments upon intangible social controls are less penetrating than revealing, but it may be useful to quote brief passages from that part of the Commission's report which envisaged the difficulties in the way of life adjustment's adoption.

"Traditional subjects are logically organized, and they are the stock in trade of teachers already trained. It is difficult to turn aside from respectable content and to venture with materials which are scarce and often poorly organized.

"Through the years the influence of the college has given prestige to traditional subjects and procedures. Sometimes this traditional influence has

been planned. Often it has been inadvertent. The influence is felt wherever classical language is considered more respectable than the household arts or wherever a school, which by its smallness is limited to one curriculum, offers the college curriculum only because it has status. While this influence is a subtle and pervasive one and thus difficult to change, it should be stated that the recent activities of many college faculties indicate a sympathetic understanding of the secondary school problem....

"When school workers are properly equipped by study, experience, and disposition, even with sufficient time for thinking and planning, it is a big task to outline units of work for pupils which aim directly at building better citizens, homemakers, and neighbors....

"A second type of difficulty exists in the unsystematized but persistent appraisal which the public makes of the schools. There are readily available criteria for judging the effectiveness of traditional courses. The school patrons and the public generally can easily de-

<sup>1</sup>*Life Adjustment Education for Every Youth*, U. S. Department of Health, Education, and Welfare, Office of Education, Bulletin 1951, No. 22, Reprint, 1953, p. 9.

termine whether or not students are being successfully prepared for college. Employers can judge readily the effectiveness of vocational departments in the high schools. It is not so simple to judge the effectiveness of schools in the more general areas of citizenship, family life, conservation, general occupational adjustment, consumer education, leisure time, or health."<sup>2</sup>

I must confess that I was not aware, until I had reread the United States Office of Education's bulletin on life adjustment education, that a subtle difference exists between education for home and family living and homemaking education. But inasmuch as these two definitions express the explicit degree to which presumptive social controls can become intangible, I give them to you for what they are worth:

"1. Education for home and family living. This term designates that part of a total education which equips individuals for effective membership in the family so that each contributes to home and community life according to his capacity.

"2. Homemaking education. This term designates *that part* of education for home and family living which is centered on home activities and relationships and which enables the individual to assume the responsibilities of homemaking."<sup>3</sup>

#### *Pressure for fragmentation*

The social pressure for the atomization of the curriculum and its finely calibrated adjustments to the felt needs of youth is perfectly understandable and in minor respects thoroughly justifiable. If we had "but world enough and time" in the four years of high school to do all the things for all the youth which all the people would like to have done, and presumably at least some of the time to do, we could make provision for all these courses and experiences. One must hastily add the other proviso; if the public gives us the money to do it. But four years is little enough time to teach our youth what they must know, what they most need to know, and for the teaching of

which the school is the sole, or certainly most appropriate, agency. If there is to be any room at all for the exercise of intangible cultural controls, and I believe we can say there should be, since schools are presumably traditionally the carriers, protectors, and enhancers of culture, then some of the multiplicity of intangible social control must be reduced and time saved for the school's business as an institution of learning.

The influence of cultural controls in American high schools is even more difficult to define and describe than social controls. It is, nevertheless, a subtle and powerful influence and not to be discounted. It is the counterweight and the balance weight which acts to equalize the political and social demands made on the school. It is chiefly expressed in the influence of the world of scholarship and letters upon learning of the arts, science, and religion. It is expressed probably most clearly, effectively, and impressively in the relations between schools and colleges in this country, and its greatest deficiency is demonstrated in the casual or light regard which liberal education has had for 50 years as part of the training for the great profession of teaching.

Cultural controls can be arthritic, too, in the dead hand of the past. And the force of a tradition of liberal learning depends upon whether it is truly enshrined in the hearts and minds of men or only embalmed in a convention or an institution. The country is not old enough to accord culture a natural respect or to hail learning with universal consent as the whole or even the chief excuse for schools. But sputniks in orbit have cleared our cultural horizons somewhat and if science is to be crowned king, perhaps the humanities, like the saints, will soon come marching in, arm in arm with music and the fine arts.

Before this can happen, however, it must be clear to the American people that the political and social aims of education are not ends but only means, that the end of education is not the production of politically minded man, socially minded man, economically minded man, or production or consumption-minded man. We must become convinced that our business is not biological or economic survival, or

political or social aggrandizement. We are not here merely to subsist or to run our economic system or our government but to enjoy the life of man. The time must soon come when we must put aside childish things, our gadgets and our fearful toys, cultivate our own gardens and ourselves, serve higher causes, and dream bolder dreams.

#### *Education as religion*

This is to state that the education of man as man must have the sanction and force of a true religion and not the casual respect and incidental attention which it has received up to the present. But if it is to be accorded quasi-religious controls, its practitioners must be as spiritually dedicated as men can be to a noble calling. What education's faith and works shall be depends ultimately upon who become the teachers in America. So far as public, nonsectarian education is concerned, I find in my experience no controls which could be defined as religious in the profession other than the controls which are expressed in the dedication of teachers to their profession. This is perhaps all that is necessary if the teacher's mind is as good as his heart for teaching, and his learning equal to his zeal.

If the ministrations of schools are to be primarily to persons, and not to governments, it should be possible for every teacher to say, "I am a teacher of men, and no state's humble servant." Teachers are servitors of a great tradition and communicants of a universal faith. That faith, as it has been taught by the great teachers of the world, holds that man is spirit and to be man it is necessary to live in spirit. The vocation of humanity requires the exercise of mind and the nurture of soul. We in the schools shall have many compromises yet to make with the appetites and the flesh, but we are obligated to know that they are compromises, and to keep clearly in our minds and in the public mind the primary and prior purposes and tasks of schools. It is only by such clarity of public and professional educational philosophy and practice that we can possibly aspire to that "habitual vision of greatness" which Alfred North Whitehead so eloquently defined as the aim of education.

<sup>2</sup> *Ibid.*, p. 11.

<sup>3</sup> *Ibid.*, p. 66.



## Free enterprise in college admissions

**An analysis of past and present competition between selective colleges and of the need for future restraints**

Competition is a pervasive force in American society. Certainly it pervades that portion of the college entrance scene where selective admissions is practiced. Here colleges compete for students and students compete for places in colleges; and in their competition they together annually recreate what is known as the "multiple application problem."

Self-denying ordinances, known in government as laws, in terms of economics as restraints of trade, are fundamental to the existence of our free society. The continuing problem of a competitive free enterprise system is the maintenance of that balance between freedom and self-restraint which will be best for the particular society. Selective college admissions is a competitive free enterprise system, and the competition is becoming freer all the time.

All colleges worthy of the name aspire to excellence and are thus striving continually for improvement. One measure of excellence is the quality of the product—their graduates. Colleges which practice "open-door" admission operate on the philosophy that this quality can be controlled primarily by selective graduation. Those which practice selective admissions believe that the quality of the end-product can be controlled much earlier in the educational process by careful choice of raw materials. My purpose is not to deal with the competitive implications of these basic philosophical differences, but only with those which exist among that group of colleges which practice or aspire to practice selective admissions.

Worthy as the pursuit of excellence by the latter group of colleges may be,

their search for the best raw materials inevitably produces competition for the better students. Obvious as this may seem, the idea that colleges are in competition is more often than not rejected with as much distaste as if it were a criminal indictment. I would like to disregard this taboo and take a deliberate look at the history of college entrance procedures, particularly as it has reflected competition between colleges practicing selective admissions.

### *Reactions evidence competition*

If a competitive situation prevails, each competitor at any given point in time stands in either a favorable or unfavorable relationship to all other competitors. Hence, any change in practice by any individual or group, whether to improve competitive position or to achieve completely different goals, is certain to disturb the competitive relationship and most likely to produce reaction. Recent history makes it clear that these conditions have prevailed in college admissions—that competition does exist.

To provide a point of departure for discussion of the growing concern about the admissions situation, the College Board staff about a year ago proposed a comprehensive matching plan which would have matched applicants to college in accordance with the "best fit" of applicants' preferential ranking of college and colleges' preferential ranking of applicants. The proposal had three stated goals: (1) to minimize confusions and uncertainties among applicants, their parents, and their schools; (2) to reduce the total workload of the admissions process and its resultant costs; and (3) to minimize

fall-out—the failure of admitted students to enroll.

Although this cure for the ills of multiple applications appeared worse than the disease and the proposal itself was rejected, discussion of the idea and the subsequent actions of some colleges give some hint, first, as to the importance attached by colleges to the proposal's three goals and, second, as to the competitive implications of their own cures. On the matter of workload and costs, the lack of response to the advantages of reduced workload sought by the proposal, and to a concurrent article, "The Mounting Costs of Multiple Applications,"<sup>1</sup> suggests that colleges generally are still willing to live with the costs that current practices generate. With respect to the goal of reducing confusion and uncertainties, the emergence of early decision plans and formalization of the "A-B-C" screening type of rolling admissions<sup>2</sup> indicate a desire to alleviate the anxieties of at least some applicants. Both of these programs are designed, of course, to approach the third goal, a reduction in the number of admitted freshmen who can fall out.

<sup>1</sup> *College Board Review*, No. 34, p. 23.

<sup>2</sup> Although early decision takes many forms, most of the plans are characterized by (1) restriction to highly qualified candidates, (2) application and action thereon in the fall of the senior high school year, (3) requirement of acceptance of admissions offers accompanied by a deposit in early winter, and (4) either designation of college as sole choice or requirement of withdrawal of all other applications on acceptance of admission offer. Under rolling admissions, offers of admission are made throughout the senior high school year with or without requirement of acceptance of offer before the Candidates Reply Date. "A-B-C" screening involves college notification of secondary school college counselors that (A) students are acceptable and need file no other applications, although acceptance of offers prior to the Candidates Reply Date is not required, (C) students are not acceptable, and (B) students lie between (A) and (C).



However, the actions taken to achieve two admittedly desirable objectives produced reaction of a kind which can be fully explained only within the context of an existing competitive situation. Ten years or so ago another device—the Candidates Reply Date Agreement—was initiated by a group of selective colleges which hoped to permit applicants a free and calm decision by not requiring admitted candidates to make a final choice of college before a given date. Toward this program, other selective colleges have developed three basic attitudes. One has been that it is impractical either to go after or even to appear to want the same students as the most selective colleges—the “different pool” attitude. A second has been that the best way to draw the abler applicants away from the most selective colleges is to get to them early with a firm offer and get them signed up—“the first with the offer” attitude. These two attitudes, of course, have lead some selective colleges to operate outside of the agreement.

The third attitude has been a double-barrelled one of “resigned coequality” which has led to participation in the Candidates Reply Date Agreement. On the one hand, there is the feeling that it is impractical to sign students up early only to lose them to more highly selective colleges later on—the “resigned” attitude. On the other hand, there is the belief that there is something to be gained by appearing to be just like the most selective colleges—the “coequal” attitude.

It is my contention that these three basic attitudes, developed in reaction to the competitive implications of the Candidates Reply Date Agreement, also explain the reaction that has already been stimulated by the early decision and “A-B-C” screening pro-



Permitting applicants a free and calm decision

grams. The joint announcement of an Early Decision Plan by seven leading women's colleges was followed almost immediately by the establishment of similar plans by other selective women's colleges. The announcement of the adoption of early decision plans by several men's colleges coincided with the public announcement of the formalization of their “A-B-C” screening program by three leading men's colleges. The adoption of the early decision concept by the second group of women's colleges represents a combination of the “first with the offer” and the “coequal” attitudes. Early decision makes it possible for the selective colleges to get there first with the offer to all applicants who are not early decision applicants to the more selective colleges, and particularly to applicants who would be regularly admissible to the more selective colleges later on in the process. At the same time, they appear to be coequal with the more selective colleges by the mere practice of early decision. The “first

with the offer” attitude would account for the adoption of early decision by the men's colleges.

These events and my interpretation of them support, then, the contention that selective college admissions is a competitive process and that action, whether for competitive or other reasons, is followed by competitive reaction. This analysis is not offered to argue that competition is either good or bad, but merely to show that it exists and should be overtly recognized. This kind of recognition leads to an acknowledgment that the colleges face one of the basic problems of a democratic society. How much restraint of trade, or, really, what kinds of self-denying ordinances should be imposed for the good of the educational community?

Restraint of trade in college admissions, if the lessons of its recent history are correct, can take only one of three forms: (1) controlling the number of applications any one college receives, (2) controlling the timing of



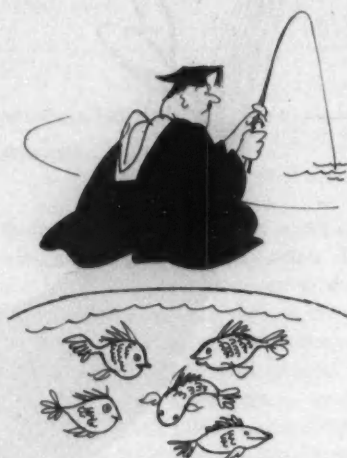
George H. Hanford is Vice President and Treasurer of the College Board.

the admissions process, and (3) mitigating the effects of competition without directly controlling numbers or timing. Prior to the founding of the College Board in 1900, students had to make an almost irrevocable choice of college some time before their senior year in secondary school. They had to do so simply because each college had its own peculiar set of curricular entrance requirements. As a result, college preparatory schools had to have about as many senior programs as their seniors had colleges in mind. The College Board was established by the colleges to relieve the schools of this intolerable situation. The natural effect of this effort, curiously, was in the long run of years to encourage the development of today's competitive situation. The establishment of common curricular requirements made student raw material acceptable to the educational processes of not one but many colleges. Then, in the 1940's, the disappearance of Carnegie unit requirements, the emergence of the Scholastic Aptitude Test as the dominant entrance testing instrument, and the transformation of subject-matter examinations from syllabi-oriented essay tests to the more general objective achievement tests served to open the competition wider by making more students acceptable to more colleges.

#### Postwar controls introduced

To counteract this trend toward freer competition, the first two mechanisms specifically designed to be in restraint of trade were introduced after World War II. The College Choice Rule was the single mechanism that has actually been put into operation to control the number of effective applications which each college has to consider. This was discarded in 1950 because from the college point of view it tended to restrict competition and from the school point of view was prejudicial to the candidate's privilege to choose among acceptances. The Candidates Reply Date Agreement, designed to control the timing of the admissions competition, until this year attracted a steadily growing number of Board member colleges. However, in 1958-59, the trend has been reversed in two ways. Not only has the proportion of members adhering to the agreement decreased,

but among them there is an increase in the number declaring exceptions to the timing control mechanism in the cases of early decision and scholarship candidates.<sup>3</sup> The proposal for a College Admissions Matching Plan, rejected by the Board's membership last year,



The "different pool" reaction

had as its goal control of both the number of applications per college and the timing of the admissions process—as, indeed, have all proposals for candidate clearing houses and matching plans. In retrospect, then, the founding of the Board, the loosening of curricular entrance requirements, the demise of the College Choice Rule, the tendency away from strict adherence to the Candidates Reply Date Agreement, and the rejection of the basic goals of the College Admissions Matching Plan appear as irrefutable evidence of a trend away from control of competition in college admissions.

While this trend away from competitive control continues, recognition of its ill effects has not been wanting, and two other methods of dealing with the competitive situation and its effects have been developed. They have in

common the purpose not of trying to control the situation directly but of trying to mitigate its undesirable effects. One set of methods defines the general rules of the game. The success of the codes of ethics of the Association of College Admissions Counselors<sup>4</sup> in defining the proper role of the admissions officer in his search for talent for his institution and of the College Scholarship Service in equalizing scholarship opportunities for students among colleges has been conspicuous and has made it easier to live with the competitive situation. Indeed, the CSS bids fair to put an end to competitive scholarship bidding for students; as it does, the competition implications of college-going will become most purely those related to admissions *per se*. Although the ACAC and the CSS methods do not control either the number of applications with which a college has to deal or the timing of the admissions process, both represent concepts which are in effect restraints of trade.

The other set of methods for mitigating the effects of the competitive situation are represented in the actions of individual colleges or small groups of colleges and cannot be considered as being in restraint of trade. They all are aimed at cutting the number of applications colleges receive, and of doing so by a pre-sort of the raw material. One subset encompasses all the ways in which colleges are attempting to contribute to improve counseling of college candidates. Altruistic as the goals of effective college guidance may be in attempting to minimize the confusion among applicants and their parents, a recognized and desired result of good guidance which steers applicants away from colleges which are above or below their potential is a reduction in the number of applications per college. College guidance, as practiced by colleges and as most clearly exemplified at the moment by the increasing number of published freshman class characteristics, does not, however, result in *group control* of either numbers of applicants per college or the timing of the admissions process. Rather, as the collective result

<sup>3</sup>In 1957-58, 150 of the 205 member colleges (73%) subscribed to the Candidates Reply Date Agreement, 52 of the 150 with exceptions for scholarship applicants (35%). In 1958-59, 158 of the 250 member colleges (63%) are subscribers, with 56 of the 158 having exceptions for scholarship applicants (35%), 46 of the 158 having exceptions for early decision applicants (29%), and 84 of the 158 colleges subscribing to the Candidates Reply Date Agreement having either one or both of the exceptions (53%).

<sup>4</sup>"Code of Ethics," *A Handbook for High School Counselors, 1958-59*, Association of College Admissions Counselors, p. 13.



of individual college actions, college guidance has a generally salutary influence on the entire field of college admissions.

The second subset of methods of individual or small group actions for mitigating the effects of the competitive situation without restraining trade brings us full circle to the earlier consideration of early decision and "A-B-C" screening. These concepts, together with the growing emphasis on improved college guidance noted above, represent the latest developments in college entrance procedures. The first two differ from the third in that the mitigating effect of fewer applicants per college is not designed to be general for all applicants to all colleges, but for certain applicants and certain colleges. While some observers believe that the ills of college admissions can be solved or salved by a series of similar individual or small group actions, these actions will inevitably be followed by competitive reaction.<sup>5</sup>

In summary, I contend: (1) that selective admissions is a competitive business, (2) that the competitive aspects of college admissions can be



The "first with the offer" alternative

controlled only by widespread limitation of the number of applications per college and/or delineation of the timing of the process, and (3) that the trend is away from control of com-

petition. The fact that colleges generally and individually are now seeking ways to mitigate the effects of freer competition is merely further evidence of the obvious—that freer competition in an expanding market brings problems with it.

To those who declare that there is a crisis in college admissions or that the situation is getting out of hand, I would suggest that the problems they identify may stem not so much from numbers of applicants at a time when all colleges are not full but from the growing freedom of competition in the selective admissions market. And to those who would seek solutions to these problems, I would point out that they must deal with the question, "How much restraint of trade, or what kinds of self-denying ordinances, must be imposed on college entrance procedures to maintain that balance between freedom and restraint which will be most advantageous for the competitive free enterprise system of college admissions?"

#### Foreseen alternatives

As I emphasized earlier, I have not meant to imply that competition is bad, but to point out that it exists and that its implications should be recognized. If the prophets of doom are wrong in forecasting that the increasing number of college-bound students either will find insufficient spaces in colleges or will, through the weight of sheer numbers, make it impossible for schools and colleges to sort students according to their potentials, there is nothing to worry about. If the prophets of doom are right, it makes no difference whether numbers or competition is the primary problem today; each is bound to compound the effects of the other if nothing corrective is done. And, since nothing can be done about the numbers of young people who are already on the scene, the only thing that can be dealt with is competition. And, unless the art of college guidance accelerates in its development at a much faster pace than it is now doing to mitigate the effects of increasing competition, the only other thing that can be done is to "control" either the number of applications with which each college deals or the timing of the process.



The "resigned coequality" attitude

In conclusion, if the college admissions situation is getting out of hand, if the infant art of college guidance does not immediately come of age, and if the lessons of the history of college admissions have meaning for the future, colleges which are practicing or desire to practice selective admissions must in the years immediately ahead choose among six separate though neither mutually exclusive nor universally desired alternatives:

1. A return to more rigid curricular entrance requirements—which will eliminate consideration of the barefoot boy from the mountainous middle-southwestern plains states; or
2. A return to more universal and stricter adherence to the letter and spirit of the Candidates Reply Date Agreement—which will mean an end to early decision and rolling admission; or
3. Widespread adoption of preliminary screening of applicants by colleges—which will entail double decision-making on many applicants; or
4. Mechanistic control of the college admissions process—which will require some sort of clearinghouse or matching plan; or
5. Earlier and earlier communication with, and decision to, applicants by movement of the admissions process earlier and earlier into the high school years; or
6. Chaos.

<sup>5</sup>The ultimate effect of a chain reaction based on the "first with the offer" attitude is fancifully described by Eugene S. Wilson in terms of kindergarten admissions and "orbiting genes" in "The Later History of Early Admissions," *College Board Review*, No. 36, p. 11.



## *Capitalizing on the federal loans for students*

The new National Defense Student Loan Program confronts the American college and university community with a quite remarkable opportunity and some equally remarkable problems.

As to opportunity, the program offers colleges the possibility of expanding greatly and rapidly their financial resources for assisting and encouraging needy and able students to come to college. It offers them a good chance, with federal support (indeed, one might say, a federal push), to catch up with the rest of the economy in developing loan credit as a strong and generally accepted element in financial aid arrangements for all students and their families.

Besides improving the strength and flexibility of financial aid plans for students, the increased use of loans for education should enable the colleges to direct our gift scholarship money better toward students who need it most. Indeed, the law obliges us to learn to measure the financial needs of our students more precisely and firmly.

Not least, as we and our students come to live with the implications of loans, we shall be working practically towards a sensible general resolution of a question now plaguing us all: how to apportion responsibility for paying for higher education between the main beneficiaries—the students and their families on the one hand, and society on the other.

However, the college community faces and must solve two hard problems before the benefits of the new loan program can be realized.

The first, most obvious, and at first appearance the most formidable problem is a general one. It may be stated as follows: Just how can colleges make student loans grow where none have grown before? If, as is often alleged, we are not now using effectively half the traditional loan funds already

available to our financial aid officers, how can we possibly make use of the enormous new student loan funds contemplated by Congress—nearly 50 million dollars for this current academic year alone, and still more in the years ahead?

The second problem is less obvious perhaps, but in the long run may well cause more trouble. How can hundreds of colleges and graduate schools across the country learn to measure accurately the financial needs of their students soon enough and well enough to administer the specific terms of the new law scrupulously?

Before attacking these two main problems that are posed for colleges by the legislation, it will be useful to make four general observations concerning it.

First, the federal government views the new loan legislation as a practical and important step toward the solution of a grave national problem: how to encourage more of our talented young people to go to college and then go on to graduate study. The general purposes of the law clearly oblige us to turn a portion of the new money into talent hunting, that is, into freshman loans.

It is well known that there is widespread skepticism in colleges (extending sometimes to hostility) with respect to student loans in general and freshman loans in particular. The skepticism, where it exists, relates to the usefulness and general acceptance of loans, and it arises mainly in situations where there is not much experience with student loans in recent years. Hostility, where it exists, relates usually to implications that student loan programing somehow represents an effort to reduce scholarship awards and to pay the increasing cost of higher education by indenturing impoverished students to a lifetime of repayments.

The new federal program provides

us a fresh new opportunity to study recent college experience with large and generous loan plans; to widen our common body of practical information by having many more colleges participating in a liberal and generous loan program; and, not least, to concentrate for a while on facts rather than on goblins and rhetoric.

My second observation is that for students who become teachers in the public elementary and secondary schools, the new program, though called a loan program, is actually an enormous, combined gift scholarship and loan program. For these students it provides forgiveness of up to half the sums borrowed.

Third, except for the one problem of measuring financial needs more accurately than before, the new federal loan program will be easy and inexpensive for colleges to administer. The federal government puts in 90 per cent of the money and so takes 90 per cent of the risk. A number of institutions have accumulated a substantial amount of experience with similar loan plans of their own (among these are Harvard University, the Massachusetts Institute of Technology, the University of Michigan, the University of Minnesota, and Yale University). This experience demonstrates that administration can be simple and inexpensive, and that in a



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well-managed program repayments are 97 to 98 per cent sure and on time.

Finally, the future of federal aid to higher education may well depend on an affirmative, scrupulous, and competent administration of the loan provisions of the new law. Colleges will surely suffer strong criticism if they fail to take advantage of the law, and they will deserve even stronger criticism if they administer the need requirements loosely. But there is surely no need for them to fail in either particular.

Let me turn now to the two main problems the law poses for colleges: how to make wider use of student loans, and how to measure need.

First, how can we make student loans grow where none have grown before? And anyway, is this a good and proper thing for us to do? In the great majority of colleges and universities, student loan funds are small and inactive or nonexistent; there is little or no experience in the development or administration of long-term, low-interest student loans, and it is often reported that "our students just do not want loans." Frequently there is the accompanying conviction on the part of deans that students should not be burdened with loans.

Is it really true that "students just do not want loans"? Evidence which has accumulated rapidly over the past 10 years and which is now fairly conclusive indicates that it is within the power of any college to develop an active student interest in loans. A number of institutions have found that, where loan program conditions are right and sensible, students and their families are eager to borrow; indeed, it is a common complaint of colleges who try out liberal and energetic loan programs that they simply cannot find enough money to keep up with the student demand.

In the first 18 months of the new Massachusetts bank plan for student loans, established in 1957, 2,000 students have borrowed more than \$1,000,000 toward college bills on terms much less favorable than the new federal plans provide. In the first six months of the New York State loan program, some 1,500 students have borrowed over \$1,000,000 from the banks. It should be noted that under the Massachusetts and New York plans

**Table 1. Harvard College long-term student loan program and scholarships since 1948**

Year	Long-term loans		Scholarship and gift aid		Tuition fee
	Number	Amount	Number	Amount	
1948-49	50 <sup>1</sup>	\$10,000 <sup>1</sup>	1,000 <sup>1</sup>	\$480,000	\$ 525
1949-50	117	30,000	1,075 <sup>1</sup>	532,000	600
1950-51	166	52,000	1,132	593,000	600
1951-52	280	86,000	1,121	589,000	600
1952-53	237	76,000	1,199	675,000	600
1953-54	332	112,000	1,173	805,000	800
1954-55	533	176,000	1,195	830,000	800
1955-56	556	211,000	1,150	832,000	800
1956-57	573	211,000	1,223	1,024,000	1,000
1957-58	600 <sup>1</sup>	240,000 <sup>1</sup>	1,220 <sup>1</sup>	1,080,000 <sup>1</sup>	1,000
1958-59	650 <sup>1</sup>	400,000 <sup>1</sup>	1,250 <sup>1</sup>	1,400,000 <sup>1</sup>	1,250

<sup>1</sup> Estimated.

students are borrowing money to pay bills at all sorts of colleges and graduate schools, many of which have inadequate loan programs of their own or none at all.

To take one major college example, Massachusetts Institute of Technology this year is lending \$600,000 on a long-term basis to some 900 of its 3,600 undergraduate students; this in the context of about \$1,000,000 in scholarship awards. Since 1930, when its great loan plan began, M.I.T. has loaned about \$4,500,000, has written off about \$12,000 in bad debts, and has received back some \$300,000 in student interest payments.

Harvard College 10 years ago was lending some \$10,000 a year to its students, in the context of annual gift scholarships of about \$500,000. In 1949-50 the college liberalized its loan terms (the new terms are very much like the terms of the new federal program) and brought together the administration of student loans, jobs, and scholarships under the responsibility of one central financial aid office.

The use of loans has shot up dramatically since. This year Harvard College will be lending \$400,000 to its undergraduates, and will also be awarding them \$1,400,000 in scholarships. It is worth noting that over half of the allocation for student loans this year is from unrestricted income. The accompanying Table 1 shows the growth of the college's loan program since 1948.

From the recent experience of a number of colleges there appear to be three trade secrets in the successful development of student loans.

The first step is to provide easy terms of interest and repayment (particularly repayment) so that the student feels confident that he can repay and that he is getting a bargain; and so that the college itself has the feeling that it is aiding the student, and not burdening him. The generous terms of the new federal program have been adopted directly from college plans which have been tested fully over the past 10 years and have proved acceptable and even popular with students and their families.

The second trade secret (which colleges share with commercial banks) is to place the contact work with customers in the hands of people who are enthusiastic about making loans and who will concentrate more on moving the money out than tightening up security to get every last nickel back.

The third step is to combine the administration of loans, jobs, and scholarships in one central college office under central control. Once the central administration of all financial aid is brought about, the college is in a position to reshape its own attitudes about the use of credit, to present a clearer case to its students and their families, and to regulate the various parts of the financial aid package.

Experience has shown that as soon as a college provides these three factors of successful loan administration—liberal terms, enthusiastic loan officers, and centralized financial aid administration—the loan operation increases dramatically, and the college usually finds itself hunting desperately for new sources of loan money.

It should be added that colleges



with large liberal loan programs find that present-day college students are excellent loan risks.

The question of whether it is desirable, proper, or moral to encourage students to borrow to help pay their college bills has arisen from time to time. I must confess to a certain bewilderment at hearing this question raised seriously in the United States today, and to hear it raised in presumed defense of individuals who, fairly soon after graduation from college, will cheerfully take on a debt of \$1,000 or more for a car, \$1,000 more for a wedding ring and for household equipment, and perhaps \$15,000 more for a house.

#### *Few deem borrowing immoral*

Certainly there are few persons left in the country who think of the act of borrowing itself as immoral or improper. Indeed, taking out a loan or buying on credit represents an opportunity for the consumer to obtain and enjoy something while paying for it. The fact is, the strength of the national economy depends on a general public habit of installment buying. The question hangs there: why not installments for education?

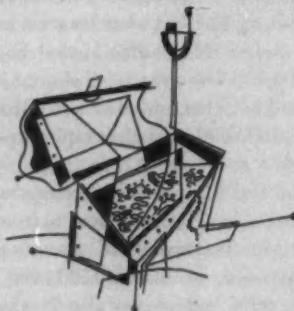
We can certainly all agree that it is undesirable to encourage a student to take out loans to the point where he is seriously overburdened by debt. And it is a fact that we in the colleges do not really know just where a reasonable amount of debt ends and overburden begins. Obviously, the notion of "overburden" really depends on the attitude of the individual borrower: a loan of \$100 is a bitter and weary burden to one man, while a loan of \$5,000 is borne cheerfully by his brother. One complication in determining the total debt load for any individual will be the necessity of taking into account graduate school loans to come as well as present undergraduate loans.

Colleges can learn an important lesson from the banks on this point. A student's educational loans will eventually be repaid mainly from income. And like the banks, we in the colleges shall do best if we have an eye on the future earning potential of the individual (as well as his present attitude) when we encourage him to borrow more than \$1,000. Perhaps in the aver-

age case we shall not want to see the total education loans of an individual exceed his expected average annual earnings for his first 10 years after completing his studies.

Such estimates of annual earnings will not be altogether simple to work out, and will be subject to error; but we owe it to the student to try as best we can to develop some sense of appropriate limits. The remission of part of the federal loans for young people who go into public school teaching sets a precedent which we may wish to try to extend to other low-paying professions or ill-paid individuals.

We may all agree certainly that it is not desirable to use loans in order to reduce drastically our scholarship and other encouragement programs for students from seriously impoverished families. One observable effect arising from the operation of the large loan programs already in existence is that faculty scholarship committees have come to feel that students who are relatively well off financially should be asked to borrow more, thus releasing scholar-



ship money for the very needy. Another effect of the large new programs, especially the Massachusetts and New York bank plans, has been certainly not to reduce existing scholarship programs but rather to expand rapidly and greatly the financial aid resources available to all students.

Such are the principal experiences and directions of the large new college loan programs which have been undertaken in the United States in recent years. It may be that these efforts are indeed improper and undesirable, but one would be hard put to support such a conclusion from the reaction of thousands of students and parents who have moved promptly, with gratitude and relief, to take advantage of the new financial aid resource.

The second major problem created for colleges by the National Defense Student Loan Program is its requirement in plain language that the student borrower shall "be in need of the amount of the loan to pursue a course of study." Moreover, the law places the responsibility for measuring the individual's need squarely on the college or university. Considering the general lack of experience and agreement among colleges and graduate schools throughout the nation in measuring student need, we may be in for a rough time of it on this point.

We should anticipate immediate difficulty and pressure in measuring need. More astute students in all fields will quickly recognize the financial advantage of a no-interest loan, and may be expected to apply for all they can get. What money they do not use (or, same thing, what money of their own they can leave untouched) they can bank or invest at interest. Students who intend to go into public school teaching may well tend to apply for the largest possible loan: the larger the loan, the larger the eventual 50 per cent remission, or scholarship.

Thus, while we must undertake to measure need carefully in all cases, we have a special reason to be careful in lending federal money to students who know when they make the loan that they are going into public school work. To be on the safe side in administering the no-interest federal loans we shall probably be well advised to think of them as a kind of gift scholarship rather than as a routine loan.

Some colleges will find it relatively easy to sort applications by need because funds will be limited and applications heavy. In such a situation we are bound to scale the candidates at least roughly according to their individual needs, and that will give us a start. We shall also be helped by the fact that the majority of candidates aiming for public school teaching come to us from families of modest circumstances; and certainly they are going out to work at modest income.

But we obviously cannot depend on these favoring circumstances for an adequate overall national solution. In a great many colleges, perhaps in most at the start, there may well not be a surplus of applications, but instead a fairly limited number of applications,



## Summary of main provisions of the National Defense Student Loan Program

### 1. General

Colleges and universities, beginning now and for the next eight years, will be able, at very small cost to themselves, to establish substantial student loan funds, with exceptionally liberal terms of repayment and very low interest charges. The National Defense Student Loan Plan at any college or university will consist of nine parts federal money and one part college money. The college itself pays no interest charge for the use of the government loan money. The college has responsibility for and bears the expense of administering the loans: it decides who shall receive loans and how much each loan shall be, issues the notes, and collects repayments. Commencing in 1966, the college agrees to return to the government quarterly its 90 per cent share of the principal and interest as the students repay.

### 2. Funds authorized and method of apportioning

Congress has authorized the following appropriations for the federal share of the loan program: \$47,500,000 for fiscal 1958-59; \$75,000,000 for 1959-60; \$82,500,000 for 1960-61; and \$90,000,000 for 1961-62. For the four fiscal years 1962-66 the Act authorizes enough appropriations to enable college students to continue with their education, if they received their first loans prior to July 1, 1962.

The money is to be apportioned among the states according to each state's share of all full-time students enrolled in the nation's colleges and universities, and within each state is to be proportionately allotted among the participating institutions. No institution may be allotted more than \$250,000 in any one fiscal year. Ordinarily, a university, including its undergraduate college and graduate schools, will be considered as a single institution of higher education.

As of January 1, 1959, only \$6,000,000 of the \$47,500,000 authorized for 1958-59 had been actually appropriated. Appropriation of all or a portion of the remaining \$41,500,000 depended on the new Congress meeting in January, and on the requirements of the colleges as shown in their response to the first applications sent out in the fall of 1958 by the United States Office of Education.

### 3. Student priorities; measurement of financial need

Institutions are to make loans from the new funds to full-time college students who are in good standing and who are "in need of the amount of the loan to pursue a course of study." All needy and worthy full-time students are eligible for the loans, but the law provides that "special consideration shall be given to (a) students with a superior academic background who express a desire to teach in elementary and secondary schools, and (b) students whose academic background

indicates a superior capacity or preparation in sciences, mathematics, engineering, or a modern foreign language."

The colleges are under obligation to use the federal loan funds in considerable part for the assistance of needy freshmen. The opening sentences of Title I of the Act, which state the general purposes, say plainly, "We must increase our efforts to identify and educate more of the talent of our nation. This requires programs that give assurance that no student of ability will be denied an opportunity for higher education because of financial need...."

### 4. Terms of student notes

Loans to any student shall not exceed \$1,000 in any year, or \$5,000 overall. Repayment is to be made in installments over a 10-year period beginning one year after the student completes or drops his studies in higher education. No interest charge and no repayments of principal will be required while the student is enrolled full time in a college or university, or during military service (not over three years). When the loan is being repaid, interest at 3 per cent is to be charged. No security will be required of student borrowers, except that in certain states minors may be required to provide the cosignature of an adult or other security. In case of death or permanent and total disability, the borrower's liability is to be canceled.

### 5. Cancellation of one-half the loans of future public school teachers

The law provides for cancellation of 10 per cent of a borrower's note (and interest) every year for five years if he serves as a full-time teacher in a public elementary or secondary school. The federal government will reimburse the college for its share of principal and interest canceled for this reason. It will probably be left to the college and the borrower to document full-time teaching service. "Teaching" will probably be interpreted to include full-time professional service in the public schools.

### 6. Oath of allegiance

A student borrower must take an oath of allegiance to the United States and will be required to file with the Commissioner of Education an affidavit that he does not believe in, or belong to, or support any subversive organization.

### 7. Loans to institutions

If a college or university is unable to provide funds of its own to put into the loan program, it may apply to the Commissioner of Education for a low-interest, long-term federal loan.

very right!

and those mainly from astute and financially secure students who are most knowledgeable in the advantages of interest-free loans. Furthermore, the federal loans will be moving in areas where there is frequently sharp competition among colleges for gifted students, and where the keenness of competition has been known in the past to dull our sensitivity to financial need (or its absence).

To do our duty under the new law, financial aid officers must set about learning to measure financial need carefully and firmly at all levels of higher education. It is high time we did. Once we set our minds to it, it may well prove to be easy.

### *Many assess undergraduate need*

The measurement of the financial need of undergraduate students—most of them aged 17 to 21 and still dependent on family support—certainly need not be difficult. Most colleges have developed systems of their own for scaling undergraduate scholarship awards, and for colleges that are not altogether sure of their ground there is now a growing body of experience in measuring need that can be consulted.

The best known and most widely used system is that of the College Scholarship Service of the College Entrance Examination Board. Some 200 colleges now use the standard financial information forms of the CSS, and are guided generally by the evaluation procedures that have been developed by the Service and its member colleges and applied successfully in making scholarship and loan awards over the past five years.<sup>1</sup>

The Big Ten Athletic Conference has developed for itself a system of financial information forms and evaluations, based on CSS procedures but adapted particularly to the experience of large state universities. The states of New York, California, Illinois, and Massachusetts, all with sizable state scholarship programs, have each developed their own forms and procedures.

<sup>1</sup> The College Scholarship Service, to assist in this aspect of the federal loan plan, has already offered and sent to any colleges requesting it, a free copy of its *Computation Manual* which explains in detail the CSS procedures for measuring need.

All these systems depend on establishing first a firm, reasonable expense budget for the student, and then setting against the expense budget a total of firm, reasonable expectations of family help and student self-help, depending on individual circumstances. Support is ordinarily expected from the following sources: from family income, family assets, student savings, student earnings in the summer and in term-time, and outside scholarship aid. What is left, after subtracting the standard expectations of family help and self-help from the standard expense budget, is the "financial need" of the student for scholarship or loan aid.

The most important thing to note is that financial need is determined more by the college's standard figures than by the student's hopeful presentation, which will often be heavy on the expense side and light on family help and self-help.

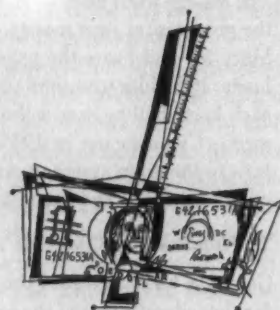
So, in making the federal loans to our college undergraduates we have firm, well-tested procedures to rely on, and our problem will not be difficult if we realize that we are obliged to parcel out these new grants carefully, like scholarships, and not loosely like ordinary loans.

When we come to make loans to our graduate students, we shall find ourselves in greater difficulty for two general reasons. First, most of our graduate students are over 21, many are married, many no longer enjoy family support; the financial psychology is all different. Second, there is among our graduate schools no widespread experience in inter-institutional cooperation, and there are no generally accepted systems of standards, comparable to those of undergraduate colleges. And the competition for able students, with the consequent blunting of sensitivity to need, seems to be quite as keen among our graduate schools as among our colleges.

Despite the obvious difficulties, the new law requires us to work toward a solution, and it may be helpful to consider whether any of the recent experience of the undergraduate colleges is applicable in the graduate area.

First, we may guess that in the graduate schools, as in the colleges, a sound estimate of the financial need of a student should depend more on standard

allowances for expenses and standard expectations of family help and self-help than on the student's own presentation of his problem and estimated need. As with undergraduate applicants for financial aid, we must be prepared to ask boldly for a detailed statement on the financial situation of the graduate student and his family. If the information is refused us, the student should become ineligible for a federal grant.



Second, in our wrestling, Protean style, with the apparently endless variety of graduate student financial situations, it may be possible to distinguish certain broad, separable categories of cases, and then to develop firm standards for measuring need within each category. Three categories come to mind at once: unmarried student; married man with no children, wife able to work; married man with children, wife unable to work. Experienced graduate scholarship offices can doubtless identify other basic categories. Inside each category we should be able to work out firm, generally applicable standards for tolerable expense budgets and expectations of family help and self-help.

Setting standard expense budgets will not be difficult if we work at it within the categories. There will be a few touchy problems—for example, under what circumstances do we allow for a car? But in general we can be guided by local tuition costs and costs of living. And we can always get information and advice from groups of our students and their wives.

Our most difficult problem will surely be to determine when we should expect a graduate student to receive support from his father and mother, and how much. Common sense gives us some preliminary guide lines. Certainly the graduate student's situation



is different, and what we expect of him should be different from what we expect of undergraduates. Certainly we need not and should not expect family support for a great many graduate students.

But what of the family with \$15,000 or \$20,000 annual income, or more? Or the family with \$50,000 in the bank? Can we expect public opinion to favor the notion that such a family's son or daughter "needs" the support of federal tax money to help pay for his graduate schooling? Does anyone doubt that we will receive applications from financially comfortable families who will make a skillful case for aid—and who will get it, too, unless we are ready with standards to screen them out?

It should be clear that the law puts our graduate schools in a favorable position—at least right now, at the start of the program—to set standards for the award of federal money and to make them stick. We are entitled, indeed we are obliged, to ask each applicant questions about his family's financial strength: annual income, asset holdings, responsibilities, difficulties, and likely future changes. Indeed, if we want to be thorough, we can learn much and can gain background and continuity for our judgment by asking the graduate applicant to submit a copy of the last financial statement he may have given to his undergraduate college in applying for financial aid there.

Exactly where shall we draw our curve of expected family support for graduate students on the graph of family income? At what point do families become sufficiently well off, in the common view of things, for us reasonably

to expect them to help support an adult son or daughter in graduate school?

It is important to note that the decision will be left to us, and it is finally not so important what particular solution we work out so long as we have some system of standards, a system that satisfies us and meets the expectations of ordinary common sense.

We may guess that very few reasonable taxpayers will complain if we exempt altogether families with incomes below \$5,000, or perhaps even \$7,000, from supporting graduate students while in college. From families with incomes above \$7,000, we may guess that some degree of support would be expected. We know we should grade our expectations according to the strength of income, and the quickest and safest guide to such a grading is probably the federal income tax.

So, for a start (for the sake of argument if nothing else), let us consider the following basic standards of expected support from family income for all our graduate students.

First, expect no support from one-child families with annual incomes of \$5,000 and below, from two-child families with incomes of \$6,000 and below, from three-child families with incomes of \$7,000 and below, and so on.

Second, above these exemption levels expect the family to continue to contribute one-half the amount it is currently paying the federal government in income tax.

Such a formula would produce the expectations of family support shown in Table 2.

Expectations from family assets are much too complicated a problem to be dealt with here. Graduate schools may

take comfort in the knowledge that there is still a wide difference of opinion on this matter within the College Scholarship Service after five years of debate. A good many colleges prefer not to tax assets at all; many others believe that the main purpose of family savings is to pay for college bills; most colleges, however, take a neutral ground.

The Service's 1958-59 *Computation Manual* contains a good treatment of the complexities of dealing with assets, and is a useful general guide. The best guess is that, as with the colleges, most graduate schools will want to go their own way in taxing family assets. It does appear, however, that we have an obligation to the taxpayer to inspect assets somehow, to ask families for the relevant information, and to take the trouble to study the information and pass judgment on it.

Should a graduate student be expected to work for wages in the summer? During term-time? How much should he earn? Should his wife be expected to work—and if so, how much should she earn? Should we expect a contribution from the student's savings? From his wife's savings? From his wife's family?

#### *Graduate aid standards will vary*

These are not easy questions, but once they are asked they can certainly be answered. It will not matter if individual institutions develop individual answers of their own. What matters very much is that all of us take the trouble to ask the questions and to develop answers. And it will surely come about and be a source of strength and comfort, that sooner or later our graduate schools, like our colleges, will share their experiences and develop some common standards for measuring need and scaling awards.

In sum, the new law appears to present our colleges and graduate schools alike with both the necessity and the opportunity to work together to develop student loans in an enormous new expansion of our financial aid programing for talented and needy students, and to discover how to mete out more carefully, in closer accordance with individual needs, the huge sums of money we expend each year on financial aid.

**Table 2. Suggested annual expectation of family support for graduate students**

Net income	Support expected according to number of dependent children in family				
	One	Two	Three	Four	Five
\$ 5,000					
6,000	\$ 360				
7,000	450	\$ 390			
8,000	550	490	\$ 420		
9,000	650	580	530	\$ 450	
10,000	750	680	620	550	\$480
11,000	850	780	720	640	580
12,000	970	890	820	740	680
13,000	1,080	1,010	930	830	770
14,000	1,200	1,130	1,050	940	870
15,000	1,320	1,250	1,170	1,050	970

## *Student credit could end colleges' financial plight*

As a whole, America's institutions of higher learning are in difficult financial straits and some way will have to be found to improve their position. It is likely that they will have to raise their tuition fees drastically in the near future. I have estimated that they will need six billion dollars per year in additional revenue within the next 10 to 12 years, even without any inflation. About three billion dollars per year of this may well have to come from increases in tuition.

However, a college education is already an expensive matter for students and parents and has steadily tended to become more expensive; on the average, the four undergraduate years now cost the student and his family about \$7,000 in actual expenses plus about \$8,000 more in income foregone. Some 40.5 per cent of college student expenses came from parent contributions in 1952-53, according to a recent survey,<sup>1</sup> and another 26.3 per cent came from student earnings. Clearly, it would be better for students to work less and study more while in college, and better for both students and parents if payment of college expenses could be spread over a longer period.

In view of this plight of institutions on the one hand and of families on the other, I propose a revolutionary expansion of loans for college student expenses: provision of loans totaling one and one-half billion dollars a year within a few years and rising to a total of two and one-half billion dollars a year by 1970. These sums of course far exceed the maximum of 90 million dollars a year for college student loans to be provided under the National Defense Education Act of 1958.

<sup>1</sup> Ernest V. Hollis, *Costs of Attending College*. U.S. Office of Education Bulletin 1957, No. 9 (Washington, D. C.: U. S. Government Printing Office, 1957), p. 48.

My proposal envisions furnishing loans that would average \$1,000 per year (ranging from \$500 minimum to \$1,500 maximum) to all students in private colleges and universities who need them; of the total amount that would thus be available, half is intended to meet current needs of students and half to meet tuition increases at private institutions. In addition, loans averaging \$500 annually would be furnished all students in public colleges and universities needing them.

The lenders may be financial institutions or, if they are unwilling or unable to finance a comprehensive loan program, the government might cooperate by providing them with loan funds and guarantees. Should the government undertake the responsibility for educational loans, the cost to the nation would be considerably less than that of the proposed federal scholarships, tax credits, and deductions from reported gross income in the income tax of parents of students, which are widely sponsored now. This is on the assumption of an unsubsidized loan program.

### *Permits faculty pay rise*

An adequate loan program on such a scale, if sufficiently publicized, could enable private institutions of higher learning to increase tuition in about five years by \$400 to \$600 from the current average level of \$600 to \$1,000 or \$1,200; it might also permit public institutions to raise their fees. The increased revenue from higher tuitions would create enough additional revenue for colleges to finance a doubling of faculty pay by 1970. Total tuition costs would rise by three billion dollars and total faculty pay by two and one-half billion dollars. The increases in tuition, of course, need not be of equal amounts or of equal proportions

for all institutions and types of institutions.

Costs to borrowers would not be large and would depend on the rates charged and the duration of the loans. For a 2 per cent loan for 50 years, for example, the annual costs would be 60 per cent less than those of a loan at 5 per cent for 20 years. Costs might be reduced by perhaps one-third or more if repayment of the loans were to be made a moral obligation and amounts repaid could be deducted from gross income reported for taxes.

Even if we allow each student to borrow \$1,000 per year, the costs exclusive of tax deductions for a 20 to 40-year loan would be less than 1 per cent of lifetime income for all of them. The kind of loan I propose is a counterpart of a house mortgage loan, the difference being that the earning power of the college graduate rather than a house is mortgaged. The current college graduate may look forward to a lifetime income of about \$750,000 (assuming a period of small inflation); his total payments on a loan of \$4,000 would be \$4,500 under a 20-year, 4 per cent loan, or \$5,200 under a 40-year, 3 per cent loan. Actually, I assume the student would borrow for only three years since that is the length of the average student's stay in college. (Impoverished students drop out at a disproportionately high rate.) Insurance on the life of the borrower, or a five-year interval after graduation before repayment begins, would of course somewhat but not greatly increase the costs to borrowers.

For various compelling reasons, greatly expanded provision of loans seems the best solution to the problems of financing higher education. A substantial loan program is a technique for spreading the costs of higher education over the working life of the student; for strengthening the financial



position of the colleges and thus enabling them to pay reasonable salaries; and for putting a greater part of the burden of higher education on the high income group, that is, on college graduates themselves.

It is absurd to concentrate the costs of higher education in a period of four years when they can be spread over 20 or 40 or (if combined with a pre-college savings program) even 60 years. With family income of \$6,500 (my estimate of average income for families with students at college in 1958), the costs per student are about 30 per cent of family income per year during the four years at college. But spread over 40 years the costs average only one-tenth as much (plus financing charges). Even this is an excessive estimate. Once we allow for the high income of the college-trained person (compared to his parents' income) and for the growth of this income over the years, and also reduce loans to three years—the average college life of a student—the charge declines to less than 1 per cent of average income as noted above.

Loan financing enables the parent to shift the financial burden of his education to the child, and the latter in turn reduces this burden by distributing it over the years and diverting payments to a later economic period when, presumably, incomes will be rising. This rise of per capita income—the result of both increased productivity and inflationary forces—enables the college student to exploit the growth of the economy and inflation.

Since the current crop of graduates can look forward to a lifetime income of \$200,000 to \$250,000 more than the non-college graduate, a system of finance should be found that enables the college student to pay a large part of the costs of his education. This esti-

mate, of course, is subject to reservations in the event of changes in the demand for college graduates and corresponding salary shifts.

As basic principles in the proposal, I have assumed that the student should pay what he can afford while at college (inclusive of savings) and should pay the remainder later; I have also assumed that neither the community nor the taxpayer should be asked to subsidize excessively either the public or the private college student.

In the field of medicine, especially, inequities of the latter kind arise. A physician graduating in 1958 can look forward to a lifetime income of one million dollars or more. Is it fair to ask the community to subsidize him over eight years to the extent of about \$11,000? (I estimate the undergraduate medical student subsidy at \$3,000 and the graduate at \$8,000.)

I would find it difficult to understand the moral position of the parent who unhesitatingly borrows to buy a car or a home and yet would be most reluctant to allow his child to mortgage 1 per cent of future income for a college education. What makes it morally acceptable for the parent to commit himself to a payment of over \$1,000 per year on his car and about \$1,500 a year for his home, and morally unacceptable for his child to commit himself to the payment of a few hundred dollars a year on a college education?

One possible objection to wider use of loans might be the special problems they presumably pose for women students. It might be answered that a girl would be afraid to borrow for her education and offer her future husband a debt instead of a dowry. But this argument can be overdone. The amounts involved are not large; a college education increases the contribution of the wife to the family; and women college graduates stay on in the labor market in greater proportion than do all women (women graduates make up one-third of all college graduates and half of them stay in the labor market).

From the viewpoint of colleges, loans are a means of balancing the books, ending the exploitation of teachers, and obtaining needed physical plant. (Incidentally, fair pay to teachers would also bring improved education and still higher productivity and income for the college graduate and the nation.)

It might be objected that, despite these manifest advantages, the American public would never accept the idea of greatly expanded loans for education. However, an extensive public relations program conducted by college leaders and other influential persons would, I am sure, successfully convince the public of the need for a very large college loan program. How can we justify 120 billion dollars or \$3,000 per family in largely nonproductive loans for homes, television sets, and the like, and only some 75 or 80 million dollars in college student loans?<sup>2</sup>

In institutions where a large-scale loan program has been tried, the results have been most satisfactory—both in response and repayments. Loans at these institutions are granted on a scale which approaches the one I propose be extended throughout the nation. For example, if allocated over the entire nation-wide college student body, loan aid as granted at the Massachusetts Institute of Technology level would mean about 300 million dollars in loans in one year; at the Harvard University undergraduate level, about 275 million dollars; at the Harvard Graduate School of Business Administration level, one and one-half billion dollars.

#### *Basis for the billions*

Let us turn now to a consideration of those factors on which I have based the previously given total sums needed for an ambitious loan program. My figures are summarized in the accompanying table.

As will be noted, the amount currently needed in loans is about one and one-half billion dollars per year; by 1970, about two and one-half billion dollars per year will be necessary. Both the current and the 1970 figures include annual loans averaging \$1,000 a year for 200,000 able students who now fail to go to college because of financial need. These 200,000 students represent 50,000 per year for each of the four undergraduate years, or roughly one-quarter of those high school grad-



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<sup>2</sup>Department of Health, Education, and Welfare, Office of Education, *Biennial survey of education in the United States, 1953-54*, Chapter IV, Section 2, "Statistics of Higher Education, Receipts, Expenditures, and Property, 1953-54" (Washington, D. C.: U. S. Government Printing Office, 1957), p. 71.





uates annually who, despite ability, do not go to college.

The average annual loan to students in private institutions as envisioned in my proposal is \$1,000. This would make possible an increase in average tuition from \$600 to \$1,100. The \$1,000 average loan value would also enable students of modest means to depend less on earnings than they now do while in college. The potential earning power of students not fully used under my proposal could be considered a reserve source of funds to colleges should they have to increase their tuition fees more than I have suggested.

On the assumption that students in public colleges and universities are generally from lower income groups than those in private institutions, I estimate that two-thirds of the former would have to borrow as compared with only one-half of the students in private colleges. Since tuition is about \$500 less in the publicly controlled institutions, I assume that the average loan for the student in these institutions would be about \$500 per year.

Student loans totaling one and one-half billion dollars a few years from now, and two and one-half billion dollars in 10 to 15 years, may seem excessive. Undoubtedly an extensive public relations program justifying loan finance would be required before we could attain loans of these proportions. But in relation to total savings and loans now in the economy and expected in the future, the total of these highly productive loans can easily be justified.

In 1957 gross savings in the nation amounted to 65 billion dollars. By 1970 they should reach 100 billion dollars on the basis of past trends, since in 1947 savings amounted to 37 billion dollars. In the 10 years ending in 1957, consumer credit rose an average of three and one-third billion dollars yearly and mortgage indebtedness about 11 billion dollars per year.

Against these figures an increase of debts for higher education of one and one-half billion to two and one-half billion dollars yearly does not seem out of line by any means. Actually, in the case of 40-year loans, repayments within 15 years would amount to about 600 million dollars per year, and in the case of 20-year loans to one and one-fifth billion; net borrowing thus being reduced from two and one-half billion dollars to less than two billion dollars in the first case and one and one-half billion dollars in the second.

#### *Boon to the economy*

How would such a large-scale student loan program influence the economy and the various interests involved? Undoubtedly one result would be that a greater share of the national income would be channelled into education. This is all to the good because we underspend for education and we need more educated men and women. Educational spending contributes disproportionately to high employment rates, since in education machine processes cannot be substituted for employees as they can in industry and business.

Therefore this kind of spending is an effective way to keep buying on an even keel with production.

Is the rise of educational debt dangerous? If the average annual increase of 30 billion dollars of all debt and 15 billion dollars of private debt over the last 10 years has not damaged our economy (in fact, it has contributed to economic health), a rise of one to two billion dollars per year for college loans is not going to destroy it. In fact, it is likely to make the economy more robust.

Moreover, a billion-dollar expansion of college loan programs is not expected immediately because of the time that would be required to launch the program and to overcome public resistance to student loans. It will in fact take several years of intensive activity to get loans up to one and one-half billion dollars per year. How much they will rise and how rapidly will depend upon the manner in which the financing is done and the way in which public relations are handled. The lower the rate of interest and the longer the financing period offered, the greater the expansion that may be expected.

In the first years, loans outstanding would tend to rise—both because new loans would exceed repayments and because the number of students taking loans would rise. Possibly college costs per student would also rise. But we cannot be sure of this, and I assume—with doubling of enrollment and increased economies—that unit costs would not rise (despite historical precedent, they might well fall). At any rate, my pro-

#### *Enrollment and estimated loans required in public and private colleges and universities, 1957 and 1970<sup>1</sup>*

	<i>Enrollment in public institutions</i>		<i>Enrollment in private institutions</i>		<i>Loan funds required for students in public institutions</i>	<i>Loan funds required for students in private institutions</i>	<i>Total loan funds required<sup>2</sup></i>
	<i>Number</i>	<i>Per cent increase over 1958</i>	<i>Number</i>	<i>Per cent increase over 1958</i>			
1958	1,800,000		1,300,000		\$ 600,000,000	\$ 650,000,000	\$1,450,000,000
1970—Projection A <sup>3</sup>	4,000,000	122%	2,000,000	54%	1,333,000,000	1,000,000,000	2,533,000,000
1970—Projection B <sup>4</sup>	3,500,000	94	2,500,000	92	1,170,000,000	1,250,000,000	2,620,000,000

<sup>1</sup> Estimates based on the assumption that one-half of the students at private institutions would each need loan aid averaging \$1,000 per year, and two-thirds of the students at public institutions would each need loan aid averaging \$500 per year.

<sup>2</sup> Includes an additional \$200,000,000 per year in the 1958 and in each of the 1970 projections to provide average loans of \$1,000 annually for one-fourth of the estimated 200,000 able students per year who do not now go to college (no allowance has been made for their number to increase by 1970 because of anticipated higher income in 1970).

<sup>3</sup> The most acceptable projection; in it, public institutions account for almost 70 per cent of the increased enrollment of 1970.

<sup>4</sup> Projection based largely on figures given by F. C. Wormald, "College Enrollment Plans for the Next 15 Years," *Association of American Colleges Bulletin*, Dec. 1956, p. 4. In this projection, public institutions account for 58 per cent of the increased enrollment of 1970.

costs actually who might be able to do so.

The average annual cost to students in private institutions is estimated in my proposal to be \$1,000. This would make possible an increase in average tuition from \$500 to \$1,100. The \$1,000 average then would be the average of students whose names to be placed on a list of students who are to be placed in college. The present average cost of students is not only under the proposed cost but also under the average of students to be placed in college. I have to believe that this is the best I have suggested.

On the assumption that students in public colleges and universities are generally from lower income groups than those in private institutions, I estimate that two-thirds of the money would have to be raised in some way with only one-third of the students in private colleges. Since tuition is about \$500 less in the public than in the private, I assume that the average cost for the student in these institutions would be about \$200 per year.

Student loans totaling one and one-half billion dollars a few years ago, and one and one-half billion dollars in 1950, may have been as high as 10 to 15 years ago. The average cost of a student in a public college is about \$500 less than in a private college. The cost of these loans would be about \$200 per year. The cost of these loans would be about \$200 per year. The cost of these loans would be about \$200 per year.

In 1957 gross savings in the nation amounted to \$2 billion dollars. In 1950 they should reach \$30 billion dollars on the basis of past trends. In 1957 savings amounted to \$7 billion dollars for the 10 years ending in 1957. Current savings are an average of three and one-half billion dollars annually and mortgage indebtedness about 11 billion dollars per year.

Capital gains taxes are a factor in the debt for higher education of our youth. Capital gains taxes are a factor in the debt for higher education of our youth. Capital gains taxes are a factor in the debt for higher education of our youth. Capital gains taxes are a factor in the debt for higher education of our youth.

There is the money.

There would be a large-scale program of raising money for higher education. This would be a large-scale program of raising money for higher education. This would be a large-scale program of raising money for higher education. This would be a large-scale program of raising money for higher education.

Therefore, this kind of spending is an effective way to keep buying on an even keel with production.

Is the rate of educational debt rising? If the average annual interest of \$1 billion dollars of all debt and 15 billion dollars of private debt were 10 percent, the total interest would be \$1 billion dollars. This is not going to destroy it. In fact, it is likely to make the economy more secure.

However, a billion-dollar expansion of college loan programs is not as great a burden as the expansion of the public debt. The public debt is a burden on the future. The public debt is a burden on the future. The public debt is a burden on the future.

expansion that may be required. In the first place, loans representing \$1 billion to the public debt are not loans which would be repaid. They are loans which would be repaid. They are loans which would be repaid.

Estimated and projected loans received by public and private colleges and universities, 1957 and 1950

Type of Institution	1950	1957	1950	1957	1950	1957
	Actual	Projected	Actual	Projected	Actual	Projected
Public	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Private	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Total	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000

1. Estimated based on the assumption that one-half of the students at private institutions would each have an average \$1,000 per year and two-thirds of the students at public institutions would each have an average \$500 per year.  
2. Includes an additional \$200,000,000 per year in the 1950 and in each of the 1951 projections to provide average loans of \$1,000 annually for each of the estimated 200,000 students per year who do not now go to college. This estimate has been used in other studies in the past.  
3. The 1950 figures are projected to be the same as the 1957 figures.  
4. The 1957 figures are projected to be the same as the 1950 figures.



posals include what is in effect a concealed reserve of \$500 per student aided, since, as mentioned previously, I have figured on allocation of part of the projected loan funds to reduction of student employment while in college. If college costs should in fact rise, students would be free to resume employment to supplement their income.

Furthermore, one must allow for the rise of national income and savings as factors that would tend to offset the increase of loans as college enrollments increase. In the last 10 years, the dollar value of gross national product almost doubled and gross savings more than doubled. There is an element of inflation in these figures, and I have assumed unrealistically no inflation in the future. Nevertheless, the growth of the economy (in stable dollars) that has been estimated at 50 to 60 per cent in 13 years is a relevant factor.

So much for the economy. What of the effects of college loans on institutions of higher learning? They should profit greatly. A rise of \$500 in tuition made possible for the most part by an adequate loan program would increase annual college resources today by about one and one-half billion dollars, or more than enough to double salaries and re-establish the economic status of faculty members at a level high enough to attract talented persons into college teaching.

In 13 years the gain would be three billion dollars against the two and one-half billion required to double salaries of the much larger teaching staff. In addition, perhaps 50 million dollars could be saved which currently goes for scholarships out of general funds. Additional income from tuition fees would greatly exceed the rise of loans, for loans available to part of the student body contribute toward a general rise of tuition charged to all.

What of the student? He would gain since the financial burden of a college education would be distributed over many years for him. He would also gain in that, on the basis of past experience, per capita incomes should be at least three times as high at the time of his retirement, and at least twice as high during most of his working life as they will be at the time of his graduation from college.

How much a loan would cost de-

pends on the rate of interest and the number of years it takes to mature. At 2 per cent for 50 years, the annual cost per \$1,000 is \$31.80; at 5 per cent for 20 years, the cost is \$80.20, or about two and one-half times as great.

Costs per student for \$1,000 per year or three years in all (the average stay in college) would be 2.28 per cent of anticipated income over 20



years for a 20-year, 4 per cent loan; for a 40-year loan at 3 per cent, the average cost would be less than 1 per cent of income over 40 years. In relation to lifetime incomes of \$750,000 for current college graduates (this assumes a small degree of inflation), the respective costs of \$4,500 for the 20-year loan or of \$5,200 for the 40-year loan are less than 1 per cent of lifetime income and even less when allowance is made for savings on income tax.

The loan burden might be reduced for those graduates with low incomes through an assessment on the basis of a percentage of income, with a ceiling for very high incomes. In other words, for a given debt, payments might vary with incomes earned after graduation. Thus, possibly the borrower might pay from one-half to 2 per cent of income for long-term loans, the exact amount to vary with the duration of the loan and the rate of interest charged on the loan. In this manner, the low-paid preacher or teacher might be spared heavy charges.

But this kind of financing might arouse more opposition than one based on repayments of amounts borrowed plus financing charges. Other approaches to differential treatment are to forgive loans for those going into low-paying professions which are currently short of manpower. The National Defense Education Act of 1958 provides that full-time teachers will be

relieved of repayments of educational loans by 10 per cent for every year of teaching with 50 per cent as maximum.

It is possible to reduce the burden of loans by giving borrowers alternatives in making payments. For example, one could provide for no payments while at college and in graduate schools, smaller percentages generally in the first 10 years out of college, and the largest percentages in the 10 to 20-year and 30 to 40-year periods after graduation. (The 20 to 30-year period after graduation is likely to be a troublesome one since the graduate's children are then at college.)

How does this proposal compare with measures for financing higher education that have either been urged upon or adopted by the federal government? Considering first the major proposed plans, there are at present great pressures on the government to provide federal scholarships or various income tax devices to help the nation's youth to secure a college education.

A typical proposed scholarship of \$750 per year for every high school graduate in the top 20 per cent in ability would cost about 450 million dollars annually now and 900 million dollars 13 years from now. Under such a plan, a large proportion of the recipients would be able to afford college in any case and to that extent the program would be wasteful, although granting scholarships on the basis of need might reduce costs as much as 50 per cent. Part of the approximately 100 million dollars now available for scholarships would cover part of the needs of the top 20 per cent.

A scholarship program of this kind should also finance about 50,000 able students each year who now fail to go to college because of insufficient resources. The annual costs for these students in all four college years (200,000 students) would be about 200 million dollars (at \$1,000 per student).

Tax credit or increased tax exemption plans, which have also been urged on the government, would be costly and wasteful because they would be available to parents irrespective of need. An educational tax credit of \$500 would cost the nation approximately one and one-half billion dollars in lost taxes. An additional tax allowance from income reported for taxes of \$600 per student would be less costly—per-





haps 300 million dollars per year at the present time. But a tax allowance yielding as much relief as a \$500 tax credit would be much more costly.

Furthermore, both tax credits and special tax exemptions are unfair, since they discriminate against those not paying income taxes or paying little. Many persons favor a tax credit program on the theory that the tax gains from charitable contributions should be equalized for low and high incomes (all taxpayers should be relieved of 92 per cent of the costs through a corresponding tax credit as are the highest incomes). Such a program, extended to all contributors, not merely to higher education, would cost the Treasury five to six billion dollars.<sup>3</sup>

Perhaps the least costly program for the government would be a guarantee of college loans; this would reduce loan rates as it did under the federal financing of home mortgages. In the six years ending in 1958, government loans and guarantees rose by 46 billion dollars or seven and three-fifths billion dollars annually, with the major rise in guarantees. There are about 85 billion dollars in loans and guarantees outstanding (estimated for June 1958).

The government could guarantee college loans or provide direct financing with little cost, compared to the alternative programs being proposed. Even a bounty of 1 per cent on the interest charged (say, a rate of  $2\frac{1}{2}$  per cent) on federal loans would cost the government only 15 million dollars a year under the proposed program in the first year, and around 200 million dollars per year in 12 years (with 20 billion dollars outstanding). College loans could then be obtained at 2 to 3 per cent net interest.

Under the National Defense Education Act of 1958, the government has provided for \$47,500,000 in student loans for fiscal 1959 rising to \$90,000,000 for fiscal 1962. The ceiling on individual loans is \$1,000 per year and \$5,000 in all for a student; the college is to contribute 10 per cent of the loan.<sup>4</sup>

With the addition of \$90,000,000 a year of federal money, the total amount



available for student loans in the nation should roughly double. This sum should also help institutions of higher education to recover an additional one and one-half billion dollars of their costs from students through tuition increases. Approximately 100,000 students or 3 per cent of all enrolled students will be able to borrow the \$1,000 a year maximum in this program. If loans averaged only \$500 instead of \$1,000 a year, 200,000 students could borrow.

The federal program is a big step forward, not only because of the amounts of money provided, but because it should help alert the nation to possibilities in loan financing of a college education. As compared to most college loan programs, the federal terms are on the generous side: 10 years to repay after full-time college study (with a three-year moratorium for military service after college), and interest of 3 per cent after repayment begins.

In an economic sense, the federal program of educational loans is especially significant. In the postwar period, partly as a result of federal policy but also because of the development of private credit, the growth of credit plans for housing, durable consumer goods, and the like has been enormous. The national spending structure has thus been modified in favor of these commodities. Greater provision of savings and credit for higher education would put education, a highly productive form of spending, on a more competitive footing with them.

Thus far I have discussed only loan-financing or what might be called post-financing of a college education. It should be observed, however, that pre-financing through savings is also possible and should be encouraged. Par-

ents financially able to do so should take out insurance when a child is one year old and assume that the direct annual costs of a college education will not be \$1,800—the average at present—but at least \$3,600 by the time the child is ready for college.

Adequate insurance of this type could solve all the financial problems of a college education. But in many instances the parents will not take these measures and in many other cases they will not be able to do so. I should add that pre-college financing is especially effective in that the interest augments funds set aside for college.

To summarize, the techniques for financing higher education could be greatly improved. The most promising approach is through loan finance. With the spreading of costs over a longer period of time, the burden on the student would be greatly reduced, both because of reduced costs per year and because of his rising potential income. The financial gains to institutions of higher learning would be great because higher, more realistic charges could be made to students. Insofar as government aid for higher education is needed, student loans or guarantees of loans would be the most economical approach.

Through loan finance, higher education would become a more strenuous bidder for the resources of the nation vis-à-vis housing, automobiles, television sets, travel, and so forth. I would especially stress this point.

Both pre-financing and post-financing of a college education have certain advantages in common: the reduction of an immediate financial burden on parents and students; the exploitation of inflationary and growth processes in the national economy by institutions of higher learning; the contribution toward higher fees and more revenue for colleges; the provision of an equitable method for financing college education; and the democratization of higher education.

Of the two methods, post-financing through loans seems the more feasible way to channel into higher education the very large sums that it urgently needs. Exploitation of credit appears to be necessary to assure a fair share of the consumer's and the investment dollar and of the nation's resources for higher education.

<sup>3</sup> *Surveys and Research Corporation, Stimulating Voluntary Giving to Higher Education and Other Programs* (Washington, D.C.: American Association for the Advancement of Science, 1958), pp. 93-97.

<sup>4</sup> See p. 15.





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BY B. ALDEN THRESHER

## Why science is vital in liberal education

In a world it is fast changing, the liberal art of science should play a part in everyone's education

What is the place of science in our culture and what should it be in the education, not of specialists, but of everyone? What should the attitudes of the public in general be toward scientific study and investigations? What are the relationships between the natural sciences and the humanities—will attention to science weaken the values of a liberal education? These are some of the questions which we in education have barely begun to face.

They are basic questions because science is not solely a product of scientists and engineers. It is an outgrowth of our entire culture. The attitudes and values of the general public form the seedbed out of which this growth arises. The attitudes and beliefs held by parents help to determine, for example, which gifted youngsters will be drawn into scientific activity. Such popular attitudes define the characteristic cultural climate of our times.

The emotional and intellectual tone of our civilization is perhaps the most important factor in determining what we succeed in accomplishing with the aid of science. Whether we can release the vast potential implicit in the intelligent utilization of science for the welfare of mankind depends on how fully our population grasps what science is and comprehends its objectives and ideals. So we had best give careful thought to the problem of science as it relates, not merely to scientists, but to everybody. Science cannot for long confer benefit on an ignorant populace, or (what comes to much the same

thing) on a populace educated only for an earlier and simpler age.

We can perhaps best approach this subject by saying that the basic problem is education for the life of our times, that is, preparation for the kind of world in which the rising generation will find itself 20 and 30 years from now. I am indebted to President Gaylord P. Harnwell of the University of Pennsylvania for calling attention to the following extract which I think is relevant to our topic. It is a first-hand account by Benjamin Franklin of a conference held in 1744 between the Indians in Virginia and the white colonists:

"After the principal business was settled, the commissioners from Virginia acquainted the Indians by a speech that there was at Williamsburg a college, with a fund for educating Indian youth; and that, if the Six Nations would send down half a dozen of their young lads to that college, the government would take care that they should be well provided for, and instructed in all the learning of the white people....

"We are convinced," the Indians replied, "that you mean to do us good by

your proposal, and we thank you heartily. But you, who are wise, must know that different nations have different conceptions of things; and you will therefore not take it amiss, if our ideas of this kind of education happen not to be the same as yours.

"We have had some experience of it; several of our young people were formerly brought up at the colleges of the northern provinces and they were instructed in all your sciences; but when they came back to us they were bad runners, ignorant of every means of living in the woods, unable to bear cold or hunger, knew neither how to build a cabin, take a deer, nor kill an enemy, spoke our language imperfectly, were therefore neither fit for hunters, warriors, nor counsellors; they were totally good for nothing.

"We are, however, not the less obliged by your kind offer, though we decline accepting it; and, to show our grateful sense of it, if the gentlemen of Virginia will send us a dozen of their sons, we will take great care of their education, instruct them in all we know, and make *men* of them."<sup>1</sup>

The interesting thing about this head-on collision of cultures and educational ideals is that both were, in their way, correct. Each with good reason advocated a kind of education which they took to be wise and right, and which was, indeed, wise and right, each in its appropriate cultural setting. The kind of education which suited the Indians' way of life and the kind of education (that is, the education of an eighteenth-century gentleman) which the white settlers as a matter of course regarded as superior to it, are now alike out of date, though there are values for us in both.



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This address was presented at the November 1958 meeting of the New York State Association of Deans and Guidance Personnel in Albany, New York.

<sup>1</sup> Paul L. Ford, *The Many Sided Franklin* (New York: The Century Co., 1899), pp. 117-118.

The changes that have taken place in our outlook and our way of life are almost entirely due to progress in the natural sciences and in their practical application to human welfare. It behooves us, therefore, to pay a good deal of attention to the nature of science, its place in education, and its relation to the other kinds of values which enter into the educational plan.

### Recommended reading

What I have to say is not original. I will attempt rather to summarize as compactly as possible the gist of some of the best and more discerning thought of our time. In the last year or two in particular a very considerable and impressive body of literature has been built up in this area, and most of it has not yet found its way into the thinking of the general public.

I would call attention particularly to the September 1958 issue of the *Scientific American*, which was devoted wholly to the concept of creativity in science, to Jacob Bronowski's *Science and Human Values*,<sup>2</sup> and to *Science and the Modern Mind*,<sup>3</sup> a collection of essays edited by Gerald Holton. I might also recommend the book of four essays entitled *Science and the Creative Spirit*,<sup>4</sup> that was recently published on the initiative of the American Council of Learned Societies. This book explores in a searching way the many-sided relationships and interaction between science and the rational faculty on the one hand, and, on the other, between science and literature, poetry, the arts, and in general the realm we call the humanities.

All of this current thinking deals with relations, resemblances, and contrasts between these two great areas of culture and thought. I commend this literature to your thoughtful attention. It has much to say to educators seeking light on the problems of our times.

Let us consider first some of the misconceptions about science that are now common and current. As Josh Billings said, it is not so much ignorance that makes trouble in this world; it's that people know so many things

that aren't so. What are some of the things people know about science that aren't so?

Science and technology are constantly confused. Technology in its broadest sense antedates science and goes back to the stone ax and earlier. In this sense, everyone has always lived in a technical civilization, but the techniques have radically changed. It is only in the last 300 years, and for the most part in the last 50 years, that our techniques of sustenance and survival have come to draw heavily on scientific progress.

Therefore, while there is an important interaction between science and technology, the two are nevertheless distinct. We are just beginning to realize that a radical defect in our elementary science teaching has been our habit of confusing the student with multifarious details of the technologies which grow out of science. This obscures and diverts his attention from the main principles of the science itself.

Science is constantly confused in people's minds with industry, big business, and mass production—and in general, with a commercialization of life and values. All of these social complexes are present in our culture today and they are interrelated with science just as they are interrelated with every other phase of current life. But they should not be mistaken for science. Though mass production is a fairly new thing, the commercialization of human values dates back many thousands of years, as does also the constant tendency of men to exploit their fellow men.

Science tends to be incorrectly equated with war and destruction. The only trouble with this point of view is that war and destruction likewise go back thousands of years whereas science is relatively new. The pass to which we have been brought in our thinking since the invention of the atomic bomb is succinctly expressed by a cartoon appearing in *The New Yorker* just after World War II. In it a boy is shown talking with his parents. His mother says, "But Robert, why do you want to be a scientist? Isn't there enough trouble in the world already?" Such a comment as this may in time be considered one of the curiosities of our troubled era.

Science is frequently equated with materialism. However, people who write about materialism often seem very vague as to what is meant by the term. I find it used in two quite opposite senses. In the first, materialism means an undue emphasis on material possessions, luxuries, conveniences, and conspicuous consumption and display, in contrast with the things of the intellect and the imagination, culture, and the arts. Of course, this again is not science at all. It may be vanity or ostentation; it may be part of the overweening pride that afflicts most of us. But it has nothing whatever to do with science.

In the second sense, the word materialism is used in quite a different way to mean inert matter as contrasted with life or spirit. People think of science as dealing with the material universe. In fact, I have heard guidance officers tell students that if they are interested in things, they should study science, but if they are interested in people, they should study the liberal arts. This pat remark embodies more misconceptions in fewer words than almost any I have ever heard.

Science embraces the study of everything in the universe, including uniformities, relationships, and ideas as well as people. The humanities encompass the study of the same range of subjects but from a quite different point of view, and there is a great deal more in common between the two than most people realize. Furthermore, science—or natural philosophy, to use the fine old phrase—has long been one of the liberal arts, certainly since the time of Archimedes and Pythagoras.

### Science is a liberal art

One of the worst mistakes that we can make, then, is to think of science and the liberal arts as alternatives, opposed in principle and mutually exclusive. Just as a person cannot be regarded as educated if he knows nothing of history, poetry, music, or drama, so he cannot be regarded as educated if he has not gained some insight into the scientific view of the world around us.

This has nothing whatever to do with possible professional specialization. I am speaking now only of the basic elements of a liberal education. We do not confine the study of litera-

<sup>2</sup> (New York: Julian Messner, Inc., 1956.)

<sup>3</sup> (Boston: Beacon Press, Inc., 1958.)

<sup>4</sup> Harcourt Brown, ed. (Toronto: University of Toronto Press, 1959.)



ture to those who plan to be novelists or historians. Why should we confine the study of science to those who plan to follow scientific professions? The day has gone by when a man ignorant of science can take a kind of perverse pride in his ignorance. An educated man today needs a grasp of science just as much as he needs some sensitivity to literature and the arts.

Poetry on the one hand (and by this I mean poetry in the broadest sense—that is, all the imaginative arts) and the rational faculty of intellect on the other are the two legs on which the mind must walk. If either is deficient, the mind will limp. A liberal education needs large simultaneous doses of poetry and analysis, and each mutually reinforces and intensifies the other. As Wordsworth put it, “poetry is the impassioned expression which is in the countenance of all science.”

The guidance counselor who thought that scientists studied “things” was of course stuck in the nineteenth-century stage of physics. And if it was engineering rather than science that he was thinking of, he was just as far off base. Engineers are fully as much concerned with people as with matter, in fact, often more so. Problems of labor, industry, government, and finance are the stuff of their daily lives. Social anthropology and psychology, to say nothing of economics, law, and sociology, are relevant to all large engineering projects and systems because only through large human organizations can such projects be carried out or such systems designed and operated.

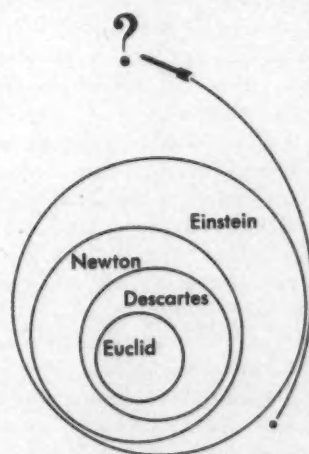
Even the “material” world of the nineteenth-century physicist has dissolved into fields of force, patterns of waves, and changing transformations of energy. It seems to be turning out after all as Prospero foretold—“We are such stuff as dreams are made on”—and that Pascal was three centuries ahead of his time when he said that the universe is “a thought in the mind of God.” The important point to keep in mind is that the poetic and analytic viewpoints—just because they are contrasting ways of looking at the world—strengthen, deepen, and reinforce each other. Each increases in its own way our insight into the nature of the world and of man.

As still another misconception, science is thought to be somehow fixed

and immutable. But in truth, science represents a series of constantly changing and growing efforts at generalization about the nature of the world around us. Perhaps the most impressive quality of science is its constant susceptibility to revision in the light of new knowledge, or, as is sometimes more important, old knowledge seen in a wider context.

It has been our clumsy and inadequate attempts to teach science that have too often stifled the originality and imaginative insight which are the lifeblood of science. As Pierre Emile Duclaux said, “Nature loves diversity while education aims at repressing it.” One of the most important reforms that will come out of the revisions now going on in high school science teaching is the view of science as a series of generalizations constantly being checked, revised, and enlarged. No scientific law is ever “disproved.” But such laws are constantly being superseded by larger generalizations which include the older principle and, in addition, account for a great range of new phenomena.

Robert Henri, the painter, remarked that “Art is the natural outcome of a state of being.” It is an impulse to express the world around us either in



words, in visual form, in music, or in drama. Emotion lies at the base of this effort. The same thing can be said of science. The mode of expression is different, but it is still true that the scientist enters into the world around him. A burning and disinterested curiosity about the nature of the universe lies behind the vast intellectual structure which has been reared by 300

years of the cumulative efforts of natural scientists.

This magnificent product of the human mind and spirit has been cheapened and degraded in the public mind by the kind of advertising which pictures science in terms of a man in a white coat who tells us what kind of toothpaste or cigarette to buy. Closer to the point is Werner Heisenberg's remark, “Natural science does not simply explain and describe nature; it is a part of the interplay between nature and ourselves; it describes nature as exposed to our method of questioning.”

### *Science and the unexpected*

Still another popular misconception stems from the fact that everybody constantly underestimates the potentiality of science for producing the unexpected. Over and over in the history of scientific research, men have discovered things about the world around them and about the universe which were wholly unexpected, unforeseen, and unimagined.

As someone has remarked, the universe is not only stranger than we imagine, it is also stranger than we *can* imagine. We make our neat logical schemes and the world won't fit into them. For centuries men were asking whether light consisted of waves or particles. Well, it turned out to resemble sometimes one, sometimes the other, and though we have learned a lot about it, there are fundamental mysteries behind the phenomena which we have not even begun to unravel. We haven't yet learned to ask the right questions.

And lastly, people who know nothing of science have been taught to think there is something one-sided, abnormal, limping, about science and scientists. As soon as science is mentioned somebody is sure to say, “But we don't want a lot of one-sided scientists.” What we have been getting, of course, is a lot of one-sided nonscientists.

For centuries our tendency has been to steer our ablest young minds into an almost exclusively literary education. This is good as far as it goes, but it is terribly one-sided. We live in a civilization which is bounded and controlled by scientific considerations on

every hand. How can the leaders of such a society cope with the problems that must constantly face them if these same leaders are ignorant of this great dominating force in our contemporary life?

An editorial in *The Times* of London recently commented on the fact that the Russian output of university graduates in engineering is enormously larger than that in America or Britain. It then went on to say, "There is no call for unreasonable alarm. It would be a dangerous mistake for too much talent of the first order to be diverted into science and technology because the strength of a democratic state depends on qualities in politics and administration which are still best fostered through a study of the liberal arts." Here is an editor, ignorant of science, who is misconceiving the nature of the problem.

Of course, the liberal arts are an essential ingredient of higher education, but science is one of the liberal arts and an indispensable one. We may contemplate with dismay the prospects of a group of wilfully ignorant people, one-sided through having had only a literary education, trying even to *understand*, let alone to manage and govern, the kind of society which the progress of science has made possible. Not only are such people incapable of coping with the perils of contemporary science, but what is perhaps even more serious, they can never realize its vast potentialities for good.

Let me quote my colleague, William R. Hawthorne, Institute professor at

the Massachusetts Institute of Technology's School for Advanced Study:

"An intelligent, educated man who has no background of scientific schooling can operate in industry or on its periphery with many mental attitudes. He can fail to see the intellectual activity described and regard industry as merely a means of manipulating resources to make money or provide defense. If this is so, his education is surely at fault. He is unfamiliar with one of the vital ideas of our times. He can only, as Job said, 'darken counsel by words without knowledge.' The process by which our sophisticated scientific knowledge fertilizes and gives life to our industrial activity is so subtle that most of those who work in industry are unconscious of it. The changing culture of a factory is obscured from those who live in it as actors concentrating on their roles.

"It is for this reason an excellent suggestion to make special arrangements when teachers visit industrial establishments. In such visits they should be able to see not machines cutting metal, but men making decisions. They should be shown the way in which the company thinks, however ashamed the company may be of its thinking processes, rather than what the company makes and what equipment it uses."<sup>5</sup>

All of this is simply a way of saying that there is no longer room in our culture for scientific illiterates posing as educated people.

What I have been saying constitutes an indictment of our educational process on all levels. It has failed to prepare our youth for the world in which they must live.

Let us now turn to some constructive suggestions on what is to be done. In particular, I want to suggest some of the things needed at the secondary school level, although most of them also need to be extended far down into the elementary grades. I shall not urge simply "more time devoted to science," or "science at the expense of a liberal education." Our needs are far more profound, our problem more complex and subtle.

First, there will have to be a continuing transformation of subjects of study which have become fossilized

and sterile. Perhaps we can put mathematics and physics at the top of this list. I am sure everyone in education is aware of the ferment now going on in the revision of secondary school mathematics. The field of mathematics has undergone extraordinary growth, evolution, and innovation in the last 50 years.

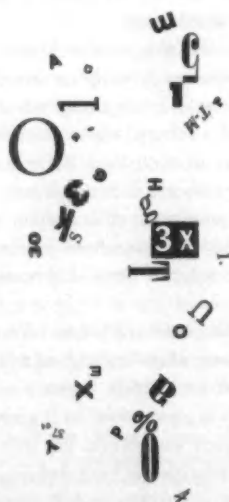
### *Reforming school mathematics*

Up until the last two or three years none of this basic work had begun to find its way into secondary school mathematics. The mathematics taught in the high schools has remained petrified: geometry in very much the form that Euclid left it in 300 B.C., algebra as the Arabs left it in the Middle Ages, and descriptive geometry as originated by Descartes in the seventeenth century. Yet the newer topics in mathematics are having a pervasive influence on our lives, not only in engineering and science, but in such fields as statistics, psychology, genetics, and even in management and business.

The newer point of view treats mathematics as an intellectual structure rather than as a bag of tricks or a body of drudgery to be learned by rule of thumb. How many students have done poorly in mathematics simply because they early acquired through outdated teachings an emotional set against the subject?

All of this will have to be changed, and in fact is being rapidly changed. The College Board's Commission on Mathematics and such groups as the University of Illinois Committee on School Mathematics Project, directed by Max Beberman, have mapped out comprehensive reforms. The School Mathematics Study Group now working under Edward G. Begle at Yale is continuing the Commission on Mathematics project into the textbook writing stage. The mathematics that you and I studied in high school will shortly be a curiosity—as perhaps you and I will, too.

Most educators are also familiar with the work of the Physical Sciences Study Committee, an interuniversity project which originated with Jerrold R. Zacharias, professor of physics at M.I.T., and which is undertaking, with full participation by high school science teachers and school of education





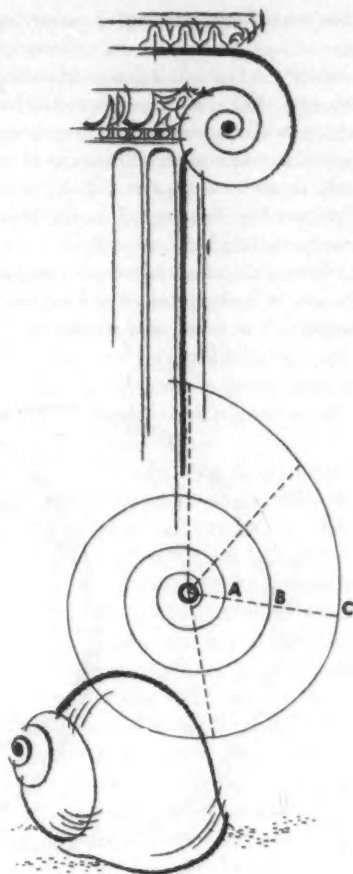
faculties, to revise completely the approach to physics in secondary school. The effort of this group is to eliminate the "gadgets-and-technology" approach to physics, to give the student at once some grasp of the vast scope of this field, and to fire his imagination by introducing him from the outset to the central problems of this most fundamental of the natural sciences.

A Ford Foundation project is seeking by TV programs to use the same imaginative treatment for the humanities at the secondary school level, and we can look for other experiments in this direction. Such projects will utilize all the aids which electronics can give us. They will certainly not supplant the classroom teacher, but will rather require teachers trained in far greater depth and with a much more imaginative grasp of their subjects than was necessary hitherto.

My second major suggestion is that we take special precautions to see that our ablest students are given a well-rounded education which includes science and not a one-sided literary education which condones scientific illiteracy. When we see a boy who seems to have the makings of a lawyer, an editor, a senator, a judge, a government administrator, or a business executive, let us no longer carefully insulate him from mathematics and the natural sciences; let us see that his in-born verbal facility and his feeling for expression are not only trained and developed but are supplemented also by the rigorous thinking of mathematics and stirred and quickened by the scientific approach to the universe.

If we do this, we shall have legislators and leaders of public opinion as well as government officials and corporate managers better qualified to make intelligent decisions in the world around us. As things now stand in public affairs, we have the blind leading the blind. Responsible people in government and industry must constantly make difficult decisions that depend on forces and on intellectual processes which they do not understand.

This arrangement is not only insane but perilous. It has been fostered by our tradition-bound thought. A command of language is obviously a prime requisite for leadership in any profession; this remains as vital as ever.



But, as Willard Gibbs long ago pointed out, mathematics is a language, too. A mastery of both English and mathematics will be increasingly important, even for people in fields such as law, where traditionally only verbal reasoning has been necessary. The reason for this can be seen, for example, in the growth of statistical analysis, which cuts across all branches of human activity, or in the spread of computer techniques, now applied to everything from Biblical scholarship to traffic control.

A third suggestion is to let the student see early that science is not confined to any particular body of subject matter. Science is, after all, a method of approach which is useful in the study of any subject whatever. One can study poetry or dreams or the fine arts in a scientific manner. Of course such study will not exhaust the values of these subjects because the world can be looked at from many angles. As George Santayana said, "Ultimate truths are more easily and adequately portrayed by poetry than by analysis.

This is no reason for forbidding analysis, but it is a reason for not banishing poetry."

It is, of course, an excellent reason for retaining both. We have managed to associate science in the minds of students with minor gadgetry of various kinds such as electronic circuits and test tube experiments in chemistry. This is all very well but it is essential that the student gain some idea of the vast scope of this way, which is at once imaginative and methodical, of studying the world around us.

Fourth, we should keep ever before the student the basic identity between science and the other liberal arts. I can convey this no better than by quoting an eloquent passage by Charles Frankel, professor of philosophy at Columbia University.

"Science is an example par excellence of a liberal art—a deliberate, selective recording of experience which releases men from the narrowness and urgency of routine affairs, carries them beyond the accidents and limitations of their lives, and makes it possible for their commerce with the world to have scope, order, and systematic consequences. It has been used as an instrument of war but its primary function is more humane and, as it were, aesthetic. And its relation to practice is the relation of any fine and liberating art. It carries men beyond the foreground of their experience and enlarges the dimensions of human choice by acquainting men with the alternative possibilities of things quite apart from the technological applications. It represents, to use an old philosophical expression, a final good, something which has its own inner dynamism, goes its own way, and can give stability and direction to the rest of our lives."<sup>6</sup>

#### *The unity of excellence*

As a direct consequence of this viewpoint, a student must come to realize that at bottom the criteria of excellence in science and the arts are similar. Both are aesthetic criteria. The ultimate appraisal of a scientific generalization or theory cannot be derived from numbers, but lies rather in the symmetry,

<sup>6</sup> *The Case for Modern Man* (New York: Harper & Brothers, 1956), p. 158.

economy, and elegance with which it summarizes the segment of experience to which it refers. There is thus a strong element of poetry and of the fine arts in science. As Walter de la Mare wrote:

"Reason has moons, but moons not hers

Lie mirrored in her sea

Confounding her astronomers

But O! delighting me!"<sup>7</sup>

Conversely, reason pervades the humanities since we cannot conceive of poetry as pure emotion; there must always be some thread of information and comment, some anchor attached to the solid world. We see this most conspicuously in history, a field that unites fact, reason, and literature. We should not judge science by isolated instances of inadequately educated scientists any more than we should judge literature and the fine arts by an occasional unstable, alcoholic poet or by the unwashed Bohemians of the "beat generation."

Whenever this subject is up for discussion, someone is sure to remark sententiously, "Science is not enough." Of course it is not enough and I don't think any sensible person would claim that it is. The point is, however, that the natural sciences form an indispensable part of human thought and of current education, and it is wrong to assume that just because someone studies science he will therefore *ipso facto* be one-sided.

No philosopher would claim that science can supply all the values which human beings require to live by. But to say that the values of science run counter to moral or aesthetic values is absurd. Science is a way of dealing intelligently with the world around us. It is a systematic use of reason which demonstrably gives us immense powers over that world, but how these powers are used is at bottom a moral issue to which science as such could scarcely supply the answer. It is unthinkable that anyone in this age could be regarded as educated who closes his mind to the world of science and to the realms of value which science has opened to human view.

As Alfred North Whitehead points out, we are now for the first time con-

fronted with the problem of preparing the new generation for a world not of stability but of rapid and accelerating change. The staid assumption that things will continue by and large to be about the same as they always were (a safe enough assumption for our forefathers) has become for us the most dangerous kind of nonsense.

We can no longer afford the pleasant luxury of a closed mind and an inert reliance on habit and tradition as

sumption that effort to deal directly with one's environment was somehow unworthy of the attention and interest of a free man. As a result, the immense fertilizing power of free thought and speculation which might have been applied to the practical arts of life was largely insulated from them. So strong was this prejudice that even scientific experiment was largely inhibited.

This initial set or attitude of mind has carried clear down through the



guides. Education from now on must put a premium on imagination, on versatility, on adaptability, and on those qualities of mind which equip men and women to cope successfully with rapidly changing situations. This kind of alertness needs to be supported by scientific habits of thought, the habits of painstaking scrutiny and rational analysis.

There is another strain of thought going back many centuries in history which has militated against an adequate public recognition of the nature and importance of science. If Greek civilization had not been erected upon a basis of slavery, our attitude toward science today would be different. In any culture in which slavery was taken for granted, and in which most practical work was carried on by slaves, it was only a step for men to assume that any practical effort to manipulate the world around them was in some sense menial and degrading.

The magnificent achievements of philosophical speculation of which the Greek mind were capable were always counterbalanced by the underlying as-

sumption that effort to deal directly with one's environment was somehow unworthy of the attention and interest of a free man. As a result, the immense fertilizing power of free thought and speculation which might have been applied to the practical arts of life was largely insulated from them. So strong was this prejudice that even scientific experiment was largely inhibited.

I would suggest next that our students be made to realize the diminishing place which exists for any kind of untrained or unskilled labor in the world of tomorrow. We only need to go back a generation or two to remember a world in which most labor was unskilled and a very small admixture of educated people in the learned professions was sufficient to keep the wheels of industry and agriculture turning. The world toward which we are fast moving is one in which there will be almost no such thing as unskilled labor, in which a high premium will be

<sup>7</sup>Martin C. Johnson, *Art and Scientific Thought*, Foreword by Walter de la Mare (London: Faber & Faber, Ltd., 1944), p. 3.



put on trained intelligence. The ability of each individual in the working world will depend on his having mastered an extensive body of knowledge and on his ability to exercise a considerable degree of judgment and responsibility.

This is going to mean a much more hospitable attitude of mind toward theory, toward principles, toward the abstract study of ideas. In other words, we shall have to provide the broad elements of a liberal education for everybody.

On this point let me briefly quote Erwin Panofsky. "A man who takes a paper dollar in exchange for 25 apples commits an act of faith and subjects himself to a theoretical doctrine as did the medieval man who paid for an indulgence. The man who is run over by an automobile is run over by mathematics, physics, and chemistry. (I could just as well have said that he is run over by Euclid, Archimedes, and Lavoisier.) He who leads the contemplative life cannot help influencing the active, just as he cannot prevent the active life from influencing his thought. Philosophical and psychological theory, historical doctrine, and all sorts of speculations and discoveries have changed and keep changing the lives of countless millions."<sup>8</sup>

All of this I think is highly relevant to the very broad principle that everybody is going to have to have much more education and much more facility in dealing with abstract thought and ideals than has been necessary in the past. We can no longer get by with giving people a few simple "how-to-do-it" rules and turning them loose in a practical world. Whitehead's famous warning to our generation can be packed into a 10-word telegram: "The nation that does not value trained intelligence is doomed."

#### *Pervasive need, final good*

Moreover, this principle will cover a far wider range of occupations than are included in the conventional emphasis upon science and engineering. The entire fields of business, commerce, and governmental administration are involved, as well as the techniques of

computers, electronic thinking, and statistics.

But throughout all these tendencies can be traced the growing insistence on science as a basic prerequisite to comprehension of the complex tasks of the world. This is the element which was missing both from the educational system of the Virginia Indian tribes, and from the system of the English settlers, each good in terms of its own culture. Excellence in education in the latter half of this century will look very different from excellence in the eighteenth century, though not all educators have yet realized this.

Finally, I would suggest that we try to convey to our students the place of science among the durable satisfactions of life. "Science is a final good." Youngsters indoctrinated from an early age in habits of observation, whether of plants, birds, weather, or customs, rocks, fishes, or folklore, have an infinite resource that will never fail them. Most of us go through life with blinders on and miss most of the interesting things we might be looking at. This is largely traceable to defects in the way you and I were educated. The joys known by the bird watcher are known also to the cloud watcher, the plant watcher, the amateur geologist and mineralogist, the student of spiders, linguistics, tornadoes, or nebulas.

These are the areas that science should open up to every child, but the child has to know what to look for. Someone has to show him, start him off, touch his imagination, kindle his enthusiasm, set him on fire. He has to learn how to look intelligently and how to follow through. Science teaches the importance of thorough and careful scrutiny extended over a long period. The world of science is infinitely wider than the few mechanical and electrical gadgets which too often form the staple of the high school approach.

It is to be hoped that the post-Sputnik reaction in favor of high standards in the schools and more attention to science will not work itself simply as a tendency to "get tough." There is a certain type of estimable citizen whose one idea of how to strengthen education is to bear down harder on all students. His theory is that it makes no difference what a boy studies so long as he dislikes it. Certainly nothing could be worse educationally.

It is true that there must always be a disciplinary side to education as to every other human enterprise; but the essence of education is persuasion, allurements, the art of touching the imagination and rousing dormant interest. This takes good teaching and it takes people who are steeped in the subject and have an imaginative grasp of its possibilities. It is this kind of secondary education which will lead in turn to the most effective work at the university level.

Let me close by quoting again from Whitehead:

"The justification for a university is that it preserves the connection between knowledge and the zest for life by uniting the young and the old in the imaginative consideration of learning. The university imparts information but it imparts it imaginatively.... This atmosphere of excitement transforms knowledge. A fact is no longer a bare fact; it is invested with all its possibilities. It is no longer a burden on the memory. It is energizing as the poet of our dreams and as the architect of our purposes."<sup>9</sup>

#### *For a changing world*

These, I think, are a few of the considerations that educators should have in mind in looking broadly at the problem of science in education. There is no place in this scheme of things for a dull, pedestrian, drudging approach to learning. Unless the imagination is set on fire the student will not make the great effort of will necessary to encompass the giant strides now needed. Beating him with a stick will never bring this about, so that we need above all things teachers who combine a thorough grounding with an imaginative grasp of the broader possibilities of the field they are teaching. And the guidance of students should not depend on stereotypes based on outworn ideas of what higher education is about but should look toward that more imaginative and resourceful intelligence. If we can develop this in the new generation, they will be better prepared than their elders were for the changing world of tomorrow.

<sup>8</sup> *Meaning in the Visual Arts* (New York: Doubleday & Co., Inc., 1955), p. 23.

<sup>9</sup> Alfred North Whitehead, *The Aims of Education and Other Essays* (New York: The Macmillan Co., 1929), p. 139.

## Two educators visit the Soviet Union

### Teaching in the Russians' best schools

BY ROBERT E. K. ROURKE

Let me begin this report on my trip to the Soviet Union with two quotations. The first is from an article by Senator William Benton in *The New York Times Magazine* of April 1, 1956:

"I have talked to the topmost Soviet educators....I returned convinced that Russia's classrooms and libraries, her laboratories and teaching methods, may threaten us more than her hydrogen bombs or guided missiles."

Here is the second quotation, which will strike a familiar note:

"Our system of education in the secondary and higher schools now evokes a great deal of talk. Very many critical remarks have revealed serious dissatisfaction with the present state of affairs. ...There are great shortcomings in the work of our schools and higher educational establishments which can no longer be tolerated."

Now, although that sounds like one of our American critics, it is in fact a quotation from Khrushchev, and he is talking about the Russian schools.

In a sense, the first quotation and the last quotation are the boundaries of my Russian experience. The first quotation led me to make up my mind to go to Russia; the second was in a Soviet press release, handed to me at the Canadian Embassy when I left Moscow early in October to return to the United States after my four-week visit.

Certain lines in the first quotation had made me wonder: "I have talked to the topmost Soviet educators....I returned convinced that Russia's classrooms and libraries...." It struck me that if you want to find out what is going on in classrooms, there are often more efficient methods than that of

talking to the "topmost educators." So I decided to go myself—particularly since this article was just one of a number that had gotten me, and I think many other people, into a panicky state of mind. Were we up against superstudents in superclassrooms with superteachers?

So I thought I would like to go to Russia, not to inspect the schools—I had no such ambitious objective—but to see their best teachers teaching their best students in their best schools, especially in my subject, secondary school mathematics. And Kent School made it possible for me to do so.

I spent 10 months in preparation, making arrangements and reading everything I could get my hands on. Eventually I got the green light—or I guess they would call it the Red Light—and I was told that the Ministry of Education would render all "necessary assistance." And this was the fact: I was given every cooperation.

I thus had an opportunity in Moscow to talk with the "topmost educators" in high school mathematics. Although I hadn't planned such talks, I did find out that the higher up you went, the more honest an answer you got to almost any question. As promised by the Ministry of Education, they took me to their best schools and let me see their best teachers teach their best students.

Let me first relate some of my impressions concerning equipment. I found a wide range in quality and quantity. One school in Leningrad—Number 157—is a showplace; any school might be proud of its equipment. Nor is that all. I spent two hours in its mathematics classrooms, and saw

some of the best teaching that I saw all the time I was in Russia.

But Number 157 must not be taken as a typical school. The only school I saw to compare with it was Number 57 in Kiev. However, even in schools like these the quality and amount of equipment in the physics laboratories and mathematics classrooms vary widely. And people with whom I talked made no bones about the fact that if you got very far from Moscow, Leningrad, Kiev, and other large centers, you find that the schools do not have much to offer in the way of equipment.

One thing that amazed me was that the brand-new schools often had the poorest laboratories and the poorest libraries of all. When I mentioned this fact to the director of one new school, she said, "Of course we haven't got much equipment. We are a new school." Apparently it takes a period of years to build up equipment in a new school.

School buildings, I found, were drab and dull by our standards. The exceptions were in Kiev, where I found the loveliest schools in Russia. Both of the schools that looked most attractive had women directors, and the use of plants and flowers to decorate their corridors made them thoroughly pleasant places. But for the most part, I found school interiors dingy and exteriors ugly.



Robert E. K. Rourke, Executive Director of the College Board's Commission on Mathematics, presented the report from which this article is adapted at the Board's fall meeting.



Within the classrooms, the most astonishing thing was the lack of adequate blackboards. What blackboards I did see were very small and were made of oilcloth on wood—even in the University of Moscow, with its magnificent pillars of marble. This lack of what we would call adequate blackboards reflects the whole method of teaching, as I shall explain later.

With regard to models and visual aids for use in mathematics classes, there were a great variety. In Kiev I saw some of the finest mathematical models I have ever seen. In one classroom every boy and girl had a fine slide rule, and there was a large demonstration model for the teacher. Everywhere students seemed to be adequately equipped with books.

Teaching methods in some cases were not impressive. They were very traditional, stiff, and formal, even allowing for the fact that there were visitors present. Rarely did I see a smile on any teacher's or student's face all the time I was in Russian classrooms. Education is pretty serious business.

The mathematics teaching that I observed seemed very, very heavily—and unfortunately—weighted with emphasis on manipulation and rote learning. This emphasis on rote learning is one reason for the lack of adequate blackboards: teachers just don't feel any need for better blackboards. On many occasions, students would stand and recite or read their solutions to assigned problems.

Moreover, while most teachers in this country make very effective use of blackboards in introducing new material, in almost every class I visited in Russia, new material was presented almost entirely by the lecture method. I saw almost no effort in Russian classrooms aimed at student discovery.

With the exception of a few in Kiev, all the teachers appeared to be on the defensive. They were on the lookout for "loaded" questions. Even a simple question was likely to evoke the attitude, "Now there's a correct answer to this, and what would they like to have me say?" Particularly if the question seemed to imply a criticism of the system, the teacher would think for a while and chatter back and forth with the interpreter before an answer would be decided upon.

Much has been said in America about teachers' salaries in the Soviet Union. In asking about them there, everywhere I went I got the same answer: salaries of teachers in high school range from 800 to 1,800 rubles a month. At the Intourist rate of exchange,<sup>1</sup> that's from \$80 to \$180 a month. However, in interpreting this, one should bear a number of things in mind. There is virtually no income tax, rents are very, very modest, and the prices of some things by our standards are low. (Of course, some prices are exorbitant—I paid \$1.68 for a chocolate bar.) After 25 years of teaching, I was also told, the teachers get something like a 40 per cent increase.

But even when all this is taken into account, it is my opinion that teachers' salaries are not nearly as impressive as we have been led to believe. I was surprised to learn that a new engineer,



fresh off the assembly line, is paid 2,000 rubles a month; and one of my guides told me about an able engineer with 15 years' experience who was getting 2,750 rubles a month.

Moreover, Canadian Embassy officials with whom I discussed these financial matters said there had been misunderstandings in Canada and the United States regarding the salaries of teachers and professors. I was advised to distinguish very carefully between the salary paid to a professor and the salary paid to an academician. An academician will get at least 5,000 rubles a month, and a very distinguished academician will get 10,000 rubles.

I found the mathematical part of

<sup>1</sup> The Intourist rate of exchange, allowed all American visitors, was 10 rubles to the dollar; the official exchange rate was four rubles to the dollar.

teacher-training to be most impressive. After visiting the Pedagogical Institute in Leningrad and examining descriptions of programs studied by prospective teachers of mathematics, I feel that nothing in the teacher-training schools in this country can compare with it. These programs, I have reason to believe, are followed very carefully, and certainly under recent modifications they give the teacher a magnificent grasp of the fundamentals of elementary mathematics. In scope and in breadth they are most admirable.

I was also very much impressed by the many fine mathematics books that have been written especially for teachers. Here I believe that Russia is miles beyond us. The writing of texts on mathematical topics to give teachers additional scope and breadth and depth is something that the Russians have done very well indeed. These works are produced by their very best mathematicians.

Of course, they do make some mistakes in judgment. On one occasion I was presented with a three-volume encyclopedia on elementary mathematics by a high-ranking official in the Ministry of Education. When questioned about these very impressive tomes, he said that they had received most flattering comments from organizations of mathematicians throughout the world. But he readily admitted that the teachers for whom the books had been intended couldn't read them because they were too difficult.

In addition to the teacher preparation program, an extensive program of in-service teacher-training is provided. For it, teachers are given time to study and are offered a wide variety of courses that they can take during the school year.

Mathematics textbooks for students are usually written in two parts, one consisting of theory and the other of problems. In general, the theoretical parts of the works were very interestingly written, while the problem parts were very heavily weighted in favor of manipulative skill.

Effective techniques for writing mathematics textbooks for students have been developed. Preparation of a text begins with the selection of a number of teams, each of which writes a book. Moreover, on each team, experts on mathematics and on the teaching of

mathematics are found. The books are next put into experimental classroom use. Then, on the basis of critiques by teachers and examination by other competent persons, adoption of one or two or three or none of the books is decided. This is all done with phenomenal ease. Three hundred schools will experiment with one new algebra textbook next year!

Textbooks are sold very cheaply indeed. A new algebra text was priced at the equivalent of 34 cents at the In-tourist ruble rate. I picked up a fine trigonometry text for 12 cents.

What did I find out about the students? They are eager and neat and willing to work. I found a great number of girls taking mathematics and physics at the ninth and tenth-grade levels, and they were among the best students in their classes. The Russians are also beginning to experiment with gifted students and are working out special programs for them. Next year a special school for the gifted will be opened in Moscow.

Even though all older students have a 33-hour school week, plus homework, their teachers do not hesitate to suggest to them that a very good way to invest their leisure time is in academic pursuits. Some fine informal mathematical and scientific education takes place in the student "circles" or clubs.

The mathematics taught at the equivalent of our secondary school level constitutes a good traditional program. Some of the things that the Commission on Mathematics is recommending are already being done by the Russians. They have for some time been treating inequalities, absolute values, vectors, complex numbers, and coordinate geometry at the secondary

school level. I thought most of this work was very well handled in the textbook discussions.

No calculus is being taught on the high school level. I have read articles in American periodicals claiming that all Russian students in the tenth grade (which corresponds to our twelfth grade) studied calculus, but I did not find this being done and no one said that it was being done.

What did I think of the leaders of Russian education? I found them impressive, and I found a magnificent collaboration between school and college people. I liked the fact that many of the curriculum builders were also doing some teaching, and that the leading officials were frank and aware of the weaknesses of their system. When I told them what I thought were the weaknesses, they agreed with me and told me what they were going to do about them.

### *Weaknesses and strengths*

After witnessing part of the vast experiment that is Russian education, I must admit that it represents tough competition. I had hoped that it wouldn't be as bad as Mr. Benton had suggested, and I don't think that it is in some ways. But in others the prospect is chilling.

What are the minuses? There is the system of rigid state control under which none of us would like to work. The state is everything, the individual nothing. There are the fears and the defenses of the teachers, which I found very depressing.

In mathematical education, I think the great weakness is the excessive formalism. Instruction is weak on concepts and unnecessarily concentrated on manipulation. Some of their mathematical educators agree with me. Another weakness lies in the lack of standards in examining high school students on what they have learned. (Some Russian writers call this "liberalism.") The frequently inadequate equipment—in particular the oilcloth blackboards—in my opinion makes for a most unfortunate type of teaching. Finally, the program of studies serves very little, if at all, the needs of the students who are lower in academic ability—the so-called "non-college-capable."

As for the strong points of Russian

education, I was impressed by the attitude of eagerness toward learning, and especially by the ease with which one can get books, whether he is a student or a worker. One day in Kiev I saw a counter 40 feet long, with people crowding all around it. It was a book counter, I found, and the books on it treated arithmetic, geometry, trigonometry, physics, chemistry, biology, and the like. Ordinary citizens were buying these books at a great rate and at very low prices indeed. I found this kind of interest in books all over; the bookstores were always crowded.

Other strengths of Soviet education are the extent of teacher-training in subject matter, and the surprisingly large number of girls studying mathematics and science. Perhaps the greatest strength of the system lies in the competence of its leaders, and the ease and flexibility with which they can bring about changes. And last, the system successfully challenges and holds the able student. It's very difficult in Russia for an able student to drop out of school or avoid higher education. I think in our country it's often very easy for able students to slip through the mesh and be lost to further education.

In conclusion, to paraphrase a television commercial, the secret ingredient of the Russian educational system is *work*. We have nothing to fear from their present program, their present teaching, their present leadership, or their present equipment.

But it isn't the present I am worried about. Neck and neck at the moment, we seem to be slowing down while they are speeding up. They are working harder than we are, and their future possibilities are simply immense. If we are going to meet the competition, in my opinion we must match their drive and resolution—and soon.

They are getting discipline from without to a marked extent. We must match this with discipline from within. For it is quite possible for a nation that is making the right decisions for the wrong reasons to dominate a nation that is making too many wrong decisions for reasons that appear democratically sound. Unless we see that our rights involve duties and our privileges involve responsibilities, we may lose our liberties in this mortal battle of the books.





## Education as the key to Soviet power

BY HENRY CHAUNCEY

Before discussing my observations on the Soviet educational system, I would like to note a few facts that might be of particular interest to readers who are college admissions officers, since they suggest that Russia has elements of an admissions officer's paradise.

At every Russian university there are three or four applicants for each opening but, if you can believe it, there are no multiple applications. Each student in Russia is allowed to apply to only one university in a given year. All the candidates have studied the same academic program. Those going into any one field have all taken the same battery of entrance examinations. Candidates are selected on the basis of their average examination grade, and only in a tie is anything else considered.

Moreover, there are no financial aid problems. Everybody gets free tuition, and 85 per cent of the students also receive a stipend for living expenses. Only the very few who can amply afford to pay their own living expenses (and these, incidentally, include college professors' sons!) are required to do so.

In addition to all this, a hypothetical admissions officer in Russia could put his thumbs in his waistcoat and feel thoroughly satisfied with himself because 89 to 93 per cent of the students who enter the universities complete their studies and earn a degree.

Now, let me hasten to explain that there are no college admissions officers in the Soviet Union. The work, such as it is, is done by a committee. And Khrushchev has indicated recently that he is not very happy with the way university admissions are being handled. So I suspect you will agree that the continuously hectic life of an admissions officer in this country is preferable to peace and quiet in Siberia!

I went to the Soviet Union last May as a member of the first team of American educators to visit under the cultural exchange program. There were 10 in our group, led by Lawrence G. Derthick, United States Commissioner of Education. We were there for four weeks and traveled widely throughout the country: from Moscow eastward to Kazan and Sverdlovsk, then far south

and west to Alma Ata and Tashkent, then back west to Sochi on the Black Sea, and north again to Minsk, Leningrad, and finally back to Moscow.

The foremost impression we all brought back was that the Russian people are completely committed to education. They are convinced that education is tremendously important, and they want to do everything possible to improve and strengthen it.

Behind this conviction is their belief that education is the foundation of national power. They believe that if they are to be scientifically, militarily, and economically strong, they must be an educated people, a people learned in many different fields. This, they believe, is the basis on which they will grow more and more powerful.

The Russians have a tremendous power drive, and their aim, as they express it on bulletin boards all over the Soviet Union, is to reach and surpass America. This is their goal, and education is its foundation stone.

A second quality that struck me very forcibly was the flexibility of the Soviet system and of those in charge of it. One tends to think of Russia as a dictatorship, a monolithic enterprise moving relentlessly ahead in one direction. But the fact is that the Russians are tremendously flexible and adapt-

able. As Henry Shapiro, the senior United Press correspondent who has lived in Russia for 25 years, said to me, "It's hard to believe this, but Russia actually is the most flexible country in the world." The Russians are continually adapting, changing, moving ahead or aside in response to various conditions—in education as in other fields.

The third point I want to mention particularly is the great progress that the Russians have made in developing their system of education over the past 40 years. Anyone who has been to Russia couldn't help but be impressed by this, and not only because they talk about it all the time.

Let me give you an example from one republic, Uzbekistan, down near Afghanistan. In 1918 its population was 98 per cent illiterate. There were only 160 schools with 17,300 pupils. Today illiteracy has been virtually wiped out, and the republic has 5,800 schools with 1,300,000 students. In 1917 it had no institutions of higher education; today it has 34.

From 1917 to the present, Soviet education has gone through a number of rather interesting phases. It inherited from the Czarist days a strictly European type of educational program for the elite, one that was very rigorous but not intended for many students. After the Revolution this whole system was discarded in favor of one that would provide education for all. Just at that time progressive education was being introduced in America, and this seemed



"How are they taking the Russian threat to American education over at the Tri-Delt house?"

to fit the Russians' needs very suitably. So they went wholeheartedly progressive, and I am told that John Dewey spent a whole year in Russia during this time.

But by the early 1930's they began to be disillusioned by progressive education because it was not producing the kind of trained individuals for scientific work or for other kinds of leadership that they needed. With their customary habit of going to extremes, they abandoned progressive education completely—and, incidentally, with it, all use of objective tests which the progressives had introduced. They have never reinstated objective testing.

Thus in 1934 the Soviet Union adopted the idea of a rather strong, thorough, academic program—one that would be given to everybody, not just to the elite. And when I say "everybody" I mean on the order of 99 per cent—all except those persons comprising something less than 1 per cent of the population whom they have found to be mentally defective for physiological reasons. It became the Soviet belief that all others, if properly trained, could be educated even in a very rigorous academic program.

This the Russians began to put into effect. In 1934 they were providing universal education through the fourth grade; by 1950, universal education had been extended through the seventh grade. As the seventh grade in Russia is comparable to the ninth grade in this country, this meant, essentially, education through junior high school. They planned by 1960 to be providing universal education through their tenth grade.

Today, education in the Soviet Union appears to have two major objectives. The first is provision of an academic type of general education for all stu-

dents through the Russian tenth grade. Achievement of this would supply a vast reservoir of people who are capable of further education along any line that may be necessary at a later time.

The second objective of Soviet education is to provide training for specific occupations, which can range from semi-skilled work in a factory through advanced research in physics. This objective is carried out through a tremendous number of different kinds of educational programs, offered in institutions that are usually much more specifically oriented toward particular occupations than would be true in this country.

### *The Soviet school system*

Let me describe quite briefly the Russian system of schools. They start with a nursery school, to which children from six months to three years of age go while their mothers work. Next come kindergartens for children from three to six. Although neither the nursery schools nor the kindergartens are universal throughout the Soviet Union, they are very rapidly spreading.

After kindergarten comes the Ten-Year School for those aged seven to 17. In about half of the Soviet Union at present these are actually only seven-year schools that take students through the seventh grade. Students finishing these seven-year schools may continue their education by going to an evening school, to a Technicum, to a labor reserve school, or by correspondence courses.

Students completing their studies in the Ten-Year School go on either to higher education or to some kind of vocational education. There are only two kinds of institutions of higher learning—the universities, which offer work in such customary academic subjects as physics, chemistry, history, linguistics, and the like; and the institutes, which offer training for the professions (except for work in law, which happens to be offered by the universities). In both the universities and the institutes, students usually take a five-year program.

Many of those who do not go on to higher education enter a Technicum for a two and one-half year course of technical training. As there are something like 4,000 of these schools with over two million students in the Soviet

Union, the Technicum forms a major part of its educational system.

Students normally enter the Technicum at the end of the tenth grade; those who enter after the seventh grade take an academic program simultaneously with their technical training.

Certain extracurricular activities are extremely important in the education of the able students in Russia. These are clubs or "circles" which are sometimes associated with the schools, and sometimes with the elaborate youth centers called "Pioneer Palaces."

The Pioneer Palaces have clubs or circles not only for such activities as dancing, art, music, or shop work, but for academic subjects as well, such as mathematics, physics, and chemistry. The leaders of these circles tend to be junior faculty members at the universities. They provide supplementary instruction and coach the best students for the "Olympiads"—tournaments by subject-matter fields that go from the local through the national level. The very highly competitive tournament examinations provide a way of encouraging and developing outstanding students that is not furnished by the regular school, where everybody takes the same program.

Let me attempt to describe this program—the program of the Ten-Year School, which is really the heart of the Soviet educational system. As I have said, it's academic and pretty rigorously so.

In the last three years of the program, the student has on the average six classes in mathematics a week; four in physics; three in chemistry; one in biology; five in literature; four in history (principally Soviet history); three in foreign languages (preceded by three years of study in the same foreign language, making a total of six years); two in geography; one in technical drawing; and two in physical education.

Clearly, this program of 30 "solids" per week, or five per day in the six-day school week, constitutes a stiff offering which everybody is expected to take, profit from, and complete. A natural question is, to what extent are they able to get 99 per cent of their students through a program like this?

After a great deal of thinking about this and trying to make the best estimate I could on the basis of various



Henry Chauncey, president of the Educational Testing Service, delivered this paper at the College Board meeting on October 29.



statistics given to me, I figured that somewhere between 50 and 80 per cent actually get through this program. Still others take a somewhat similar but perhaps slightly watered-down version of it in Technicums or labor reserve schools, or by correspondence. By contrast, in this country we have generally thought that only 15, 20, or 25 per cent of our students could take such a program.

How do the Russians get students through such a difficult program? A number of factors might be related to this. Let me review some of them quickly, and some in more detail.

Teachers, I think, are one of the key factors in the success of the Soviet educational program. Teaching is a very attractive profession in Russia. There are four or five applicants for every opening in the teachers colleges. These teachers colleges, or "pedagogical institutes," have a five-year program with thorough training both in the subject matter that the individual is to teach and in methods and principles of teaching and educational psychology.

#### *Teaching aids developed centrally*

Teachers, once they start working, are expected to spend one summer out of three in further training. Each week they have one day off which is devoted to professional development. In a number of cities there are teachers' clubs where specialists are available with whom teachers may consult on pedagogical problems. Teachers are also supposed to do some outside reading in their field and report on it from time to time.

The generally accepted full-time teaching load is somewhat lighter than it is in this country—18 hours a week. Those who teach more than that are paid extra for it. Teachers also do a considerable amount of individual tutoring as well, because they are held responsible for the success or failure of their students.

New textbooks and new teaching aids are another factor influencing the effectiveness of the Russian academic program. These are developed by an elaborate, centralized system for which we, of course, have no parallel in this country. The work is coordinated by the Institute of Methods, a division of the Soviet Academy of Pedagogical Sci-

ences. Scholars or scientists who are usually among the very few top people in their fields in the whole Soviet Union collaborate with the Institute of Methods to develop new textbooks.

Texts are very widely considered, reviewed, and tried out experimentally before their final adoption. Those in the sciences and mathematics tend to be used throughout the Soviet Union. Individual republics that want to emphasize their own literature and history may substitute their own textbooks in these fields.

Sound films and other visual aids are also prepared by the Institute of Methods and are designed to supplement the textbooks in getting difficult concepts and ideas across to the students. As an example of the availability of visual aids, a well-equipped school may use something like 80 films in physics, 30 in chemistry, and 100 in biology. It will also have multitudes of charts. I have never seen so many charts as there are in the Russian schools. A typical classroom will have charts all around the walls and several hundred more in a closet. Schools are also provided with three-dimensional visual aids and with special monographs for students who want to read further in a subject.

In preparing textbooks and supplementary materials like these, the Russians have taken a lot more trouble than we have to make sure that the texts and the teaching aids embody both the best and latest thinking of scholars in the field and the best and latest teaching methods that have been developed.

One more reason why the Russians are able to pull a large proportion of people through an academic program—and I think they get too many through, as I will explain later—is the motivation of the students. Their motivation is extremely high, especially because a student can fairly well predict what his income and prestige will be 20 years later by the grades he is getting in school. Salaries in the Soviet Union are usually fixed in accordance with how much education is required for the job.

But let us now consider some of the major consequences of Russia's massive effort to educate the entire population in an academic program.

First, in recent years the Russians have been training many more students in a college preparatory program than



could ever be admitted to a university or an institute. Although they have been graduating about 1,500,000 students a year from the Ten-Year Schools, they can annually accommodate in institutions of higher education only some 250,000 full-time students and 200,000 part-time students. Thus only one in every three graduates of the Ten-Year Schools has been able to go into higher education. Yet all of them have been inspired with this as a goal, and they have slaved through work that for many of them was terribly difficult because they hoped to go on to higher education.

Obviously, grave disappointment has resulted when graduates of the Ten-Year Schools have gone to work instead of into higher education. Not only are they disgruntled workers but they haven't been prepared to do the kind of work required of them on farms or in industry.

When all this became evident a number of years ago, so-called polytechnical instruction was introduced on an experimental basis throughout the Ten-Year School program. Along with the academic program, courses in handicrafts, woodworking, and metal working were given in the early grades. In the later grades the polytechnical offerings included machine shop, electrical shop, and periods of actual work in industry on perhaps two days of the school week.

This polytechnical instruction was supposed to introduce students to factory work or to enable those who were going on to the university to know how the other half lives. Still, many students were unhappy because their hopes for going to the university had to be sacri-

ficed to satisfy the economy's need for more workers.

A new solution of this problem was introduced only last April, when Khrushchev announced that all students finishing the Ten-Year Schools should work for two years before going to the university. This would get more people into the labor market and would give those students who were going on to the university a chance to know what factory work is really like. Actually, although the announcement implied all students would be required to work for two years, it was clear that the Russians intended to allow some mathematicians and scientists to continue their studies without interruption.

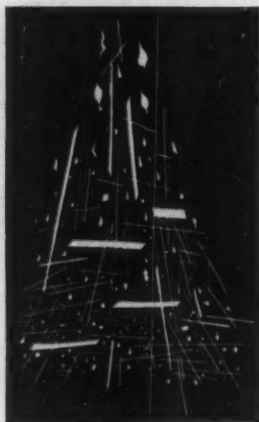
But since last April the Russians have begun to realize that neither the polytechnical program nor requiring students to work for two years before going on to the university is really going to solve a grave problem that lies ahead of them. Russia is confronted with a situation completely different from the one we face. We have had the familiar big bulge in our birth rate that began during the years of World War II. Russia, on the other hand, had a decline in its birth rate during the war. It therefore has fewer rather than more young people coming through the educational system and entering the economy at the present time.

#### *Acute labor shortage*

The statistics on this are quite dramatic. Those students in Russia who were 17 years old a year ago and who were then of the normal tenth-grade age numbered 6,250,000. But those who will be 17 years old next year, two years later, number only 3,250,000, just a little more than half.

To make matters worse, the 6,250,000 17-year-olds of a year ago minus the 1,500,000 who are regularly studying in the tenth grade leaves 4,750,000 17-year-olds available for work in the factory and on the farm. But next year's 3,250,000 17-year-olds, less 1,500,000 in school, would leave only 1,750,000 available for work. Because of the very rapid rate at which the Russian economy is growing, they need workers and cannot now afford to have as many people continuing their education as in the past. This constitutes a serious problem.

Accordingly, Khrushchev made a subsequent announcement only last September. The proposals in it, he observed, were being made by the Presidium of the Central Committee of the Communist Party. He suggested that these should be discussed up and down the land so that reactions could be considered in making final plans.<sup>1</sup> The key



statement in his announcement was this:

"All boys and girls without exception will go to work after the eighth grade, and do their studying on a shift basis or in the evening or by correspondence."

In the light of what I have already said, the major and immediate consequence of this would be to relieve somewhat the imminent shortage of young people available for work.

Two other statements in the announcement are of unusual interest. First, Khrushchev contradicted within the same article the statement "without exception" and said that the very able students in the arts and music, in mathematics and the sciences, would continue to study full time at special schools.

Second, he stated that those who go to work after the eighth grade and later apply to a university would be admitted on the basis not only of exami-

nations but also of recommendations of both the trade union and the Young Communist League.

Khrushchev noted that 70 per cent of those going on to universities had come from families of intellectual workers and office workers, and only 30 per cent from the vast population of industrial workers and farmers. This imbalance should be corrected, he observed. Although he did not say this, he was probably concerned over the development of an intellectual elite that apparently was tending to be perpetuated from one generation to the next and might sooner or later threaten the Communist Party leadership.

In any case, two new hurdles will probably be introduced for a very large proportion of those who will be admitted to college: first, approval by the trade union, which means that students must have been good workers and comrades; and second, approval by the Young Communist League, which means that they must have seemed to be either good potential Party members or at least the kind of people in whom the Party could have confidence.

Now I doubt that these developments indicate any less devotion on the part of the Russian people and the Soviet leaders to education. What they do indicate is that Russia has certain grave problems with which to contend, particularly the shortage of workers, and that it has to consider doing things differently, at least for awhile.

These developments also mean, perhaps, that the over-enthusiasm for general education of an academic type for everybody, regardless of ability, is going to be tempered.

Above all, Americans should make no mistake about the Russians' commitment to education. They believe it to be the foundation of their national power. They are energetic, systematic, and adaptable in its improvements. They can put major changes into effect in a brief three or four years, as they have been doing, for example, in the polytechnical program. And they will press forward in the educational field, not to bring about the full development of the individual so that he may lead a rich and rewarding life, but to make a strong and powerful country—one that will reach and surpass America in scientific prowess, military might, and economic abundance.

<sup>1</sup> Readers interested in the text of the resulting final legislation may consult, "A law on strengthening tie [sic] between school and life and on further developing the public education system in the USSR," *Pravda* and *Izvestia* of Dec. 25, 1958, translated in *The Current Digest of the Soviet Press* (published at Columbia University), vol. XI (1959), no. 3.—Ed.



## Puzzles and powers in junior SAT scores

From 1953 to 1958 the number of secondary school seniors taking the College Board's Scholastic Aptitude Test each year increased two and one-half times. By contrast, over the same five years the number of juniors annually taking the test increased six times.

This phenomenal growth in junior SAT testing is due to several causes. Underlying them all is the fact that more colleges have steadily become more selective. As a result of the consequently greater uncertainty and anxiety about college admission, counselors in the schools have increasingly encouraged their juniors to take the SAT—some recommending it chiefly for practice, others for guidance, still others for both.

Colleges, too, have increasingly encouraged junior testing. Many of them have long admitted small portions of their freshman classes directly from the eleventh grade. The growing college practice of rating prospective applicants with school officials in the fall of the student's senior year has swelled the number of junior SAT candidates. So also have the recently introduced "early decision" plans, in which colleges make admissions decisions early in the applicant's senior year.

School and college officials, then, are frequently giving advice and making decisions on the basis of junior SAT scores. Sometimes these will be scores for students tested only as juniors, sometimes scores for students tested both as juniors and seniors. Furthermore, these junior-only or junior and senior SAT scores must very often be compared with the SAT scores of students tested only as seniors.

How best to use or compare the scores of SAT candidates in all three categories—junior-only, junior-senior, and senior-only—is not only a frequent but a complex problem. This article attempts to suggest to school counselors on the one hand and admissions offi-

cers on the other how they might best solve this problem, as well as certain others posed by junior SAT testing.

Perhaps the first thing that school officials should consider with respect to junior testing is why it might be advised at all. A survey made on this point several years ago questioned secondary schools which had relatively large numbers of juniors taking the SAT.

The overwhelming reason cited by the schools was to afford students practice on the test. A second but definitely subordinate reason for junior testing was, according to school officials, the guidance value of early test scores. But two recently completed studies demonstrate that the practice effect of previous testing on senior scores is of little consequence, and that the real value of junior scores lies in using them to advise students about their college plans.

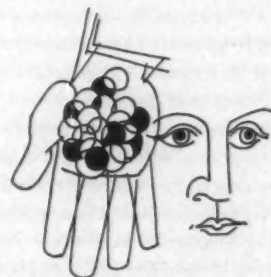
The first of these studies found that the SAT-Verbal and SAT-Mathematical scores of seniors who had previously taken the test as juniors would each be, on the average, only 10 points higher due to previous practice than the SAT-V and SAT-M scores of comparable students tested only as seniors.<sup>1</sup> But whatever effect a trial run on the test may have on a student's psyche, this average practice effect of 10 points is, in itself, an insufficient reason for recommending junior testing.

An advantage as small as 10 points is of no value in most admissions and scholarship selection decisions. (This should be particularly clear in view of the 600-point SAT score scale, with its

200 to 800 range.) Moreover, the 10-point average practice gain is rendered even less important because experienced admissions and scholarship officers allow for practice in comparing scores.

The second study compared the junior and senior scores of 1,650 students and the senior scores of another 1,718 students with their average grades during the first two years at nine College Board member colleges.<sup>2</sup> The main finding of interest to school officials is that for students taking the SAT both as juniors and as seniors, the junior scores have virtually the same validity in predicting college grades as the senior scores.

In view of the fact that junior scores are available in time to be used with other information in advising students about choosing colleges, this finding would seem to confirm the prime value of junior scores in guidance. And be-



cause junior scores are now known to be quite dependable as an index of college performance, school advisers can interpret junior scores with more assurance in counseling students.

Moreover, for most students the three-year high school record is consistent with the three and one-half year

<sup>1</sup> Richard S. Levine and William H. Angoff, "The effects of practice and growth on scores of the Scholastic Aptitude Test," Educational Testing Service, 1956. Because of learning or growth from junior to senior testing, it was also found in the study, the corresponding increase in SAT-V and SAT-M scores would each average 25 points.

<sup>2</sup> Marjorie Olsen and W. B. Schrader, "Relation of preliminary and final Scholastic Aptitude Test scores to college grades: preliminary report," Educational Testing Service, 1958.



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record—as are other kinds of information used in assisting and evaluating students. Since this is so, school counselors (and also admissions officers) have enough tangible data to make some very good early estimates of a student's probable success at a variety of colleges.

All of this means that the guidance officer can use the information available at the end of a student's junior year—his SAT scores, school record, and indications of personal promise—and relate it to what he knows or can find out about admissions practices at various colleges.

#### Use with "class profiles"

In connection with the latter, the detailed descriptions of the characteristics of admitted classes that are being issued by an increasing number of colleges can be used to estimate a given student's chances for acceptance and academic success. These class profiles attempt to explain a college's admissions policy and document it with figures showing class rank, College Board test scores, and other pertinent information describing a recently admitted class. In addition, there is a wealth of useful information in *College Board Scores No. 2*<sup>3</sup> and the *1957 Supplement to College Board Scores No. 2*<sup>4</sup> which enables a counselor to estimate the admissibility of a particular student at various kinds of colleges.

Of course, counselors can also estimate a student's probable success on the basis of their experience over the years. For example, school advisers can compile the achievement records of their former students at individual

colleges or groups of similar colleges and use this information to estimate a given student's chance of doing well at a particular college.

In using a student's junior SAT scores to advise him on the choice of a college, school officials will very often have to estimate what his senior SAT scores are likely to be. Practically all the available data—the official's own experience, colleges' class profiles, College Board tables—are based on senior scores.

Counselors can make a good estimate of the senior SAT score of a student tested as a junior by adding to both SAT-V and SAT-M scores about 35 points each—10 points for practice and about 25 for learning or growth. A further refinement can be made for the SAT-M score since this is more susceptible to influence by a student's course work. For students who are or will be studying mathematics in the senior year, add a total of about 50 points to the junior SAT-M score; for those not studying mathematics in senior year, add a total of about 20 points to the junior score.

Of course, all these increments are average figures; although they are the best figures to use in estimating senior scores, they should be considered only as general guides and approximations.

Because College Board test scores of seniors need no longer be kept confidential, school officials in particular will be called upon to account for the mystifying differences between junior and senior SAT scores of individual students or groups of students that often arise. Doing so is a task that presents particular difficulty.

In order to understand why surprising differences occur, let us consider the phenomenon of change in SAT scores from junior to senior testing, first in the individual case. When a previously tested student retakes the SAT in his senior year, one of three things can happen. Either his SAT-V or SAT-M score will remain about the same, will go up, or will go down. The best estimate of what will happen to an individual's scores is what happens to those of the group as a whole, namely, the average result.

Remember, though, that these average figures are based on thousands of seniors' scores. Any individual's score change may be considerably above or

below the average change. Individual scores may vary widely from the average because, unfortunately, two things always affect test scores.

The first is the inability of any test to measure completely all aspects of the skill the test is evaluating. This results in what test experts call the unreliability or the error of measurement of a test—in short, its instability.<sup>5</sup>

The second factor in the way of obtaining a theoretically "true" score is the variation in the test-taking behavior of students. This may of course be affected by many factors—motivation, anxiety, discomfort, headaches, distractions, misreading instructions, forgetting eyeglasses, and similar imponderables.

Describing these two factors is another way of saying that, in testing, both the measuring instrument and the thing being measured can and do vary from one measurement to the next. However, this is a characteristic that testing shares with all other kinds of measurement—as is the fact that variations in individual measurements fall within known limits.

When a student takes the SAT at administrations eight or 10 months apart, these two sources of error—his test-taking behavior and the test's less than perfect measuring power—are reflected in the scores earned on each occasion and have a compound effect on the amounts by which his scores may have changed. In fact, the amount of score change (or score difference) from one SAT administration to another consists in large part of these compounded contaminating factors.

The effects of these factors may either cancel each other or accumulate. A student may be "lucky" during the two testings and receive higher scores than he should or "unlucky" and obtain lower scores than he should. His luck might also be fickle, once very good and once very bad, and result in unusually large gains or losses.

The kinds of score change for an individual student that a school or college officer can expect from junior to

<sup>5</sup> A similar but less important source of minor differences between a student's junior and senior SAT scores is the "equating error"—a measure of variations in the comparability of different editions of the test. This error is very small and for the purposes of this discussion need not be considered.

<sup>3</sup> (New York: College Entrance Examination Board, 1955.)

<sup>4</sup> (New York: College Entrance Examination Board, 1957.)



senior testing are shown in Table 1. This table is based on analysis of thousands of cases.

Notice in Table 1 that the average gain, the 35 points discussed earlier, falls in the 25-49 point range and has the highest probability of occurring, 21 chances in 100. In connection with score loss, on the other hand, a totaling of the chances in 100 that a student will experience losses demonstrates that there are 28 chances in 100, or more than 1 chance in 4, that his score will drop by some amount. This can also be expressed by saying that 28 per cent, or slightly more than one-fourth of all students tested both as juniors and seniors, actually do experience a drop. However, the odds against the largest gains or losses in an individual case are very high, and their actual occurrence is relatively rare.

Moreover, not only the likely amount of SAT score change but the meaning of score change for a given individual is difficult to determine. Of the four factors related to score change—practice, growth, student test-taking behavior, and the fallability of the test itself—the last usually accounts for most of the difference between junior and senior scores. This fact would strongly argue against attempting to read too much meaning into differences between the junior and senior scores for any one student.

For example, Bill's SAT-V scores were 480 as a junior and 520 as a senior—a 40 point difference. Tom's SAT-V scores were 540 junior and 500 senior—a 40 point difference in the other direction.

**Table 1. Probability of change in junior-senior SAT scores**

Gains <sup>1</sup>	Chances in 100	Losses <sup>2</sup>	Chances in 100
0-24	19	1-25	14
25-49	21	26-50	8
50-74	15	51-75	4
74-99	10	76 or more	2
100-124	4		
125 or more	3		

<sup>1</sup> Range of points by which either the SAT-V or SAT-M score made by a student as a senior may exceed the corresponding score he made as a junior.

<sup>2</sup> Range of points by which either the SAT-V or SAT-M score made by a student as a senior may fall below the corresponding score he made as a junior.

In the case of individuals like this, it would be extremely dubious to attach any significance to the fact that Bill gained 40 points while Tom dropped 40; that is, an admissions officer would be mistaken in attaching more weight to Bill's scores simply because they reflected a gain.

Similarly, a school official should not cast about for extrinsic reasons to explain the fact that one boy gained while the other lost. Contrasting changes in their scores should not be attributed to Tom's and Bill's teachers, courses, or motivation.

However, on the few occasions when clear-cut evidence is available, meaningful interpretations can be made for large score differences. For example, a boy or girl may take the SAT while under some intense personal anxiety, like that caused by a seriously ill parent. This may adversely affect performance and therefore result in an explainable score difference. Extenuating factors like these should always be communicated to college officials.

As with the score change of individuals from junior to senior-year SAT testing, the average change of relatively small groups of students may also vary widely and apparently at random. A school official may find that the SAT scores of most or even all the students in his school show gains smaller than expected. In some cases, the SAT-V or SAT-M scores of all the students in the school may go down from junior to senior year.

Occurrences like these are almost always the effect of chance. An example may help to explain them.

Picture a huge box filled with several hundred thousand marbles which are either black or white. Each marble represents the SAT score of a senior who had also taken an earlier SAT. Each white marble represents a score that went up between the two testings; each black marble represents a score which dropped. Remember that over one-fourth of these marbles, 28 per cent, will be black ones, reflecting largely the difficulties that are inherent in all testing.

Now dip into the box and begin extracting handfuls of marbles, each handful representing all of the students from a single school. Most of the time you will find a mixture of black and white marbles, preponderantly

white. Sometimes you will remove a group of all white marbles. But occasionally you will come up with a batch of marbles all of which are black. This represents a school where all candidates' scores dropped and the phenomenon is best accounted for by chance factors. It is distressing, but it can and often does happen in even the best of schools.

Routine studies made each year to insure the comparability of different



editions of the SAT document the fact that there is great variability from year to year in the amount of score change shown by students from a single school.<sup>6</sup> One year the average change in a school may be a gain of 60 points; the following year the average change in the same school may be a loss of 30 points.

These studies also show that the changes in the average SAT-V and SAT-M scores of students in a single school vary quite independently of each other. That is, a high average SAT-V score gain may or may not be accompanied by a high SAT-M gain; a large average SAT-V score loss may or may not be accompanied by a large SAT-M loss. The same thing, of course, holds true for individual students.

College officials are faced with somewhat different problems when confronted with the three different types of test-taking patterns—junior-only, junior-senior, and senior-only. An admissions officer has to estimate senior SAT scores on the basis of junior SAT scores in advising or even deciding on a junior's admission. Moreover, when a student presents both junior and senior scores, colleges need standard rules for obtaining the best estimate of his abil-

<sup>6</sup> The most recently reported study is: Richard W. Watkins, "Changes in Scholastic Aptitude Test scores of candidates tested in the junior and senior years," Educational Testing Service, 1958.

ity from the two sets of SAT scores.

Because the majority of SAT candidates take the test only as seniors, it seems best to state rules of thumb for colleges which put all students on an equal footing, that of senior-year testing only. Of course, if students tested only in their junior year are to be compared solely with each other, no corrections need be made. But when decisions are to be made about juniors



on the basis of an admissions committee's experience with senior scores or on the basis of cumulated norms based on senior scores, junior SAT scores should be converted to the senior-only footing.

Certain ways of using junior and senior SAT scores when both are available to college admissions officers are not recommended.

First, do not use only one score and ignore the other. Two scores are likely to be more representative of a student's ability than one, and the usable information reflected in an additional score should not be rejected; furthermore, combining the results of two testings in a meaningful way is more desirable than using whichever score is higher.

Second, do not merely average an individual's junior and senior SAT scores; a weighted combination of the scores is better than a simple average for comparing students with junior-senior SAT scores and students with only senior SAT scores.

The following suggestions are recommended to college officers as simple but dependable rules for estimating senior SAT scores from junior SAT scores and for combining junior and senior SAT scores of individual candidates.

1. To estimate a senior SAT-V score from a junior SAT-V score, add 25 points (the expected amount of growth) to the junior SAT-V score.

For example, Ethel is an early decision candidate with a junior SAT-V

score of 620. Adding 25 points to this gives 645, her expected SAT-V score had she taken the SAT only as a senior.

2. To estimate a senior SAT-M score from a junior SAT-M score, add 40 points to the scores of those who have studied or will study mathematics in the senior year. However, add only 10 points to the scores of those who have not or will not study mathematics as seniors. (As with the preceding one, this rule produces estimates of SAT-M scores that the students would receive if tested only as seniors—not of what their senior scores would be after taking the test as juniors.)

3. To combine a student's junior and senior SAT-V scores, double the senior score, add the junior score, and divide by three.

This rule has the net effect of allowing the average amount of 25 points for growth and of diminishing the 10-point average practice effect. The practice effect is automatically offset in the formula because seniors tested only once do not have a practice factor in their scores. The rule therefore equates the results of two testings with the scores of seniors tested but once, and should result in fairer comparisons than would score corrections that did not offset the 10-point practice effect.

*Example:* Bill's SAT-V scores are 480 junior and 520 senior.

$$\begin{aligned} & \frac{2 \times \text{senior SAT-V} + \text{junior SAT-V}}{3} \\ &= \frac{2(520) + 480}{3} \\ & \frac{1,040 + 480}{3} = \frac{1,520}{3} = 506\% \end{aligned}$$

4. To combine the junior and senior SAT-M score of a student who has not studied mathematics in the senior year, use the preceding rule 3, substituting SAT-M for SAT-V.

5. To combine the SAT-M scores of a student who has studied mathematics in the senior year, similarly use rule 3 but add 10 points to the result obtained from the formula. (As this would indicate, the SAT-M score is more susceptible to influence by the student's course work than the SAT-V score.)

*Example:* Bill's SAT-M scores are 510 junior and 550 senior.

$$\frac{2(550) + 510}{3} = \frac{1,610}{3} = 536\%$$

If Bill studied mathematics in his senior year:

$$537 \text{ (rounded off)} + 10 = 547$$

Note that all of the corrections given apply whether the student was tested in March or May of the junior year. When the scores of a large number of candidates are analyzed, small score differences are found for groups of students tested in different months of the junior year. But these group differences are small enough to be inconsequential for individual corrections.

It should be stated that many of the suggested corrections derived from these recent studies are not, to any large extent, inconsistent with recommendations based on earlier studies.<sup>7</sup> But there are differences. To avoid confusion it would be wiser to apply the above rules, which are based on more recent findings.

Although the suggested methods for estimating senior scores and for combining two scores into a single estimate of a student's ability have advantages over other methods—mainly using the higher score or simply averaging the two—the fact remains that the result is still a test score. It will be of great use to guidance counselors and admissions officers in evaluating students' abilities. It should not, however, be an overriding factor in counseling or admitting students.

For students coming from schools with which the college is thoroughly familiar, or for students going to colleges with which the school is thoroughly familiar, the high school record is still the best single indicator of college success. Test scores provide important, sometimes indispensable information about the student. But scores must be considered in the light of all the other known factors that relate to the student's choice of a college, chances of acceptance, and more importantly, chances of competing successfully at a level which will prove challenging and rewarding.

<sup>7</sup> On the basis of a 1947 study, it was suggested the senior SAT-V scores of junior-senior candidates reflected a 20 point practice effect and a gain of 3½ points per month due to growth. In 1955, test users were advised to combine the junior and senior SAT-V scores of a candidate by adding 15 points for practice plus 3 points per month for growth to the junior score, adding double the final score to this corrected score, and dividing by three.



- Adelphi College\*
- Agnes Scott College†
- Albertus Magnus College\*†
- Alfred University
- Allegheny College
- American International College\*
- Amherst College
- Annhurst College\*†
- Antioch College\*
- Assumption College®
- Bard College
- Barnard College†
- Bates College
- Beaver College\*
- Beloit College
- Bennington College†
- Boston College
- Boston University
- Bowdoin College
- Brandeis University
- Brown University
- Bryn Mawr College†
- Bucknell University
- Caldwell College\*
- California Institute of Technology
- Carleton College
- Carnegie Institute of Technology
- Carroll College (Wis.)®
- Case Institute of Technology®
- Catholic University of America\*
- Cedar Crest College
- Centre College of Kentucky
- Chatham College
- Chestnut Hill College\*†
- City College of the City of New York®
- Claremont Men's College
- Clark University (Mass.)\*
- Clarkson College of Technology
- Coe College®
- Coker College\*†®
- Colby College
- Colgate University
- College of Mount Saint Vincent\*
- College of New Rochelle\*
- College of Notre Dame of Maryland\*†
- College of Puget Sound®
- College of Saint Elizabeth\*
- College of Saint Rose\*
- College of the Holy Cross
- College of William and Mary\*
- College of Wooster
- Colorado College\*†
- Columbia College (N. Y.)
- Connecticut College†
- Converse College®
- Cooper Union
- Cornell College®
- Cornell University
- Dartmouth College†
- Davidson College
- Denison University
- DePauw University
- Dickinson College
- Douglass College

- Drew University
- Duke University
- Dunbarton College of Holy Cross\*
- D'Youville College\*
- Elmira College\*
- Emerson College®
- Emmanuel College
- Emory University
- Fordham College\*
- Franklin and Marshall College\*
- Furman University
- Georgetown University
- George Washington University
- Georgia Institute of Technology
- Georgian Court College\*
- Gettysburg College
- Gonzaga University®
- Goucher College†
- Grinnell College
- Hamilton College
- Hampden-Sydney College
- Harvard College
- Haverford College
- Hobart College and William Smith College\*†
- Hofstra College®
- Hollins College†
- Hood College
- Immaculata College®
- Immaculate Heart College\*
- Iona College
- Jackson College for Women†
- Johns Hopkins University®
- Kalamazoo College
- Kenyon College
- Keuka College
- Knox College
- Lafayette College
- Lake Erie College
- Lake Forest College
- La Salle College†
- Lawrence College\*
- Lebanon Valley College®
- Lehigh University
- Lewis and Clark College
- Loyola University of Los Angeles\*†
- Loyola University (La.)\*®
- Lycoming College®
- Manhattan College†
- Manhattanville College of the Sacred Heart†
- Marquette University®
- Mary Baldwin College\*†
- Marymount College (N. Y.)\*
- Mary Washington College of the University of Virginia®
- Marywood College\*†
- Massachusetts Institute of Technology
- McGill University
- Menlo College®
- Mercer University
- Michigan State University
- Middlebury College\*†
- Mills College
- Moravian College\*†
- Mount Holyoke College†

## College Board member colleges

Check (✓) indicates participants in the College Scholarship Service. Dot (•) indicates subscribers to the May 20 Candidates Reply Date Agreement for 1959 (see page 2). An asterisk (\*) following a college's name means scholarship candidates are excepted from the Candidates Reply Date Agreement; a dagger (†) means single-choice, "early decision" candidates are excepted from the Agreement; a dot in a circle (°) indicates colleges elected to membership at the Board meeting on October 29.

- Mount St. Agnes College\*†°
- Mount St. Mary's College (Calif.)\*°
- Muhlenberg College
- Muskingum College
- Nazareth College (N. Y.)
- Newark College of Engineering\*
- Newcomb College of Tulane University\*†
- Newton College of the Sacred Heart
- New York University
- North Carolina State College®
- Northeastern University\*
- Northwestern University
- Norwich University°
- Notre Dame College of Staten Island\*
- Occidental College
- Ohio Wesleyan University
- Pembroke College in Brown University†
- Pennsylvania State University
- Pomona College
- Presbyterian College®
- Princeton University
- Providence College
- Queens College (N. C.)
- Radcliffe College†
- Randolph-Macon Women's College†
- Reed College
- Regis College (Mass.)
- Rensselaer Polytechnic Institute
- Rice Institute
- Ripon College®
- Rollins College
- Rosary College®
- Rosary Hill College®
- Rosemont College\*
- Rose Polytechnic Institute®
- Russell Sage College
- Rutgers, the State University of New Jersey
- St. Joseph College (Conn.)†
- St. Joseph College (Md.)\*
- St. Joseph's College (Pa.)
- St. Joseph's College for Women\*
- St. Lawrence University
- St. Mary's College (Ind.)\*
- St. Michael's College®
- Salem College (N. C.)\*†
- Sarah Lawrence College†
- Scripps College
- Seton Hill College\*
- Shorter College (Ga.)
- Simmons College
- Skidmore College
- Smith College†
- Southwestern at Memphis
- Springfield College®
- Stanford University
- Stetson University®
- Stevens Institute of Technology
- Swarthmore College
- Sweet Briar College†
- Syracuse University
- Temple University®
- Thiel College
- Trinity College (Conn.)
- Trinity College (Wash., D. C.)\*
- Tufts College of Tufts University
- Tulane University\*†
- Union College (N. Y.)\*†
- United States Air Force Academy
- United States Merchant Marine Academy
- United States Military Academy
- United States Naval Academy
- University of California
- University of Chicago†
- University of Colorado
- University of Connecticut
- University of Denver
- University of Georgia
- University of Maine®
- University of Massachusetts
- University of Michigan
- University of North Carolina®
- University of Notre Dame
- University of Pennsylvania
- University of Pittsburgh®
- University of Redlands
- University of Rhode Island\*
- University of Rochester†
- University of San Francisco
- University of Santa Clara®
- University of Southern California
- University of the South
- University of Vermont
- University of Virginia
- Upsala College\*°
- Ursinus College
- Valparaiso University
- Vanderbilt University®
- Vassar College†
- Villanova University
- Wabash College
- Wagner Lutheran College
- Washington College®
- Washington and Jefferson College\*
- Washington and Lee University\*
- Wellesley College†
- Wells College†
- Wesleyan College (Ga.)°
- Wesleyan University
- Western College for Women
- Western Reserve University
- Wheaton College (Ill.)°
- Wheaton College (Mass.)†
- Wheelock College\*†
- Whitman College
- Whittier College
- Willamette University†°
- Williams College
- Wilmington College (Ohio)°
- Wilson College
- Woman's College of the University of North Carolina®
- Worcester Polytechnic Institute
- Yale University
- Yeshiva University

## Non-member colleges participating in CSS

- Bradford Junior College
- Bradley University
- Clarke College (Iowa)
- Colby Junior College
- Holy Family College (Pa.)
- Illinois College
- Illinois Wesleyan University
- John Carroll University
- Junista College
- La Verne College
- Lindenwood College
- MacMurray College
- Monmouth College (Ill.)
- National College of Education
- Oberlin College
- Pennsylvania Military College
- Pfeiffer College
- Polytechnic Institute of Brooklyn
- Pratt Institute
- Rhode Island School of Design
- St. John's College (Md.)
- St. Joseph's College (Ind.)
- St. Olaf College
- Transylvania College
- University of Buffalo
- University of Kansas City
- University of New Hampshire
- Wake Forest College
- Westminster College (Pa.)
- Wittenberg College

## NEWS OF THE COLLEGE SCHOLARSHIP SERVICE

### Sent to college presidents

**Help with federal loans:** Information on need evaluation and on planning and administering student aid programs was sent to the presidents of more than 2,000 colleges and universities by the College Scholarship Service in December.

A covering letter explained that the CSS had received many inquiries since the recent passage of the National Defense Education Act and that the materials enclosed were being distributed as a public service in connection with the Act's provisions for student loans. The letter observed that the federal loan program required determination of student financial need, about which the Service had accumulated much information.

**1,200 colleges respond:** Included with the letter were reprints of two recent *College Board Review* articles and a return postcard with which a complimentary copy of the current CSS *Computation Manual* could be requested. Some 1,200 institutions asked for copies of the book, which was characterized as "the Service's handbook on scholarship program administration and need measurement."

Subsequent mailings enclosing reprints of the articles in this issue by John U. Monro (p. 12) and Seymour Harris (p. 18) have also been planned.

### Third consolidated reports

**Cover 1957-58 activities:** The third set of "consolidated reports" to be issued by the CSS were sent in January to the 175 colleges that participated in the Service last year.

Each college's report lists the names of all students who had applied during 1957-58 for financial aid and had also applied for aid at other participating colleges. It shows all aid offers and

awards made in that year to the applicants by participants and identifies the colleges.

The consolidated report enables a college to compare the results of its policies and procedures for determining need and awarding aid with those of other colleges and to consult with other colleges if it wishes.

Consolidated reports have been prepared for each year of the Service's operations except 1956-57, when it was decided to issue them biennially. The next reports should thus cover 1959-60 activities.

Colleges supply the information on their offers and awards that is given in the reports as a condition of participation, entering it on lists of candidates they have in common with other participants. Sent to the colleges by the Service in the summer, these lists are due back in the fall and furnish the data appearing in consolidated form on the final reports.

### Volume rises

**From 20,811 parents:** Through the month of January, 20,811 parents had filed copies of the CSS financial statement form with the Service, as required by participating colleges to which their sons or daughters were applying for financial aid.

By the same time last year, the Service had received 20,604 copies of the form, which it duplicates and sends to colleges indicated by the parents. Total receipts of forms through January are thus 1 per cent above last year's despite the recent introduction of independent use of parallel forms by two large sponsored scholarship programs that had previously used the CSS form, the National Merit and the California state programs.

**Up 26 per cent:** Computations performed by the Service through Janu-

ary totaled 3,200, over 26 per cent more than the 2,532 prepared by the same time last year. Supplied in worksheet form to colleges contracting for them, computations are estimates of the annual sum that an applicant's family can reasonably afford to contribute toward the costs of his college education.

### Changes recommended

**Computations for all:** Introduction next fall of CSS-computed estimates of "parents' ability to pay" for all candidates filing forms was recently recommended by the CSS Committee for consideration by the Trustees of the College Board. It also recommended a \$1 increase in candidate fees to cover the cost of the "universal" computations. Computations are now ordered and paid for by the participating college.

In another recommendation, the Committee proposed the introduction next fall of distribution to students of blank CSS financial statement forms through secondary schools. The forms have been available only from participants and CSS offices.

### Teach in Midwest, Far West

**Computation fundamentals:** Two of its regular "computation school" programs were recently conducted in distant locations by the CSS, one being given at Knox College in Illinois on January 5-7 and the other at Stanford University in California on February 2-3.

Each of the school programs was attended by representatives of more than 20 colleges who had enrolled to learn the fundamentals of CSS need computation procedures. Also attending were representatives of the Illinois and the California state scholarship programs. Past or present CSS Committee members and members of the CSS staff served as instructors.



